

ORO-585

## HEALTH AND SAFETY

BASIC DATA FROM VEGETATION STUDIES RELATED TO  
THE MOVEMENT OF RADIOACTIVE WASTES

I. Chemical and Physical Data on  
Soils and Plants of White Oak Lake Bed,  
Oak Ridge, Tennessee, 1956-1960

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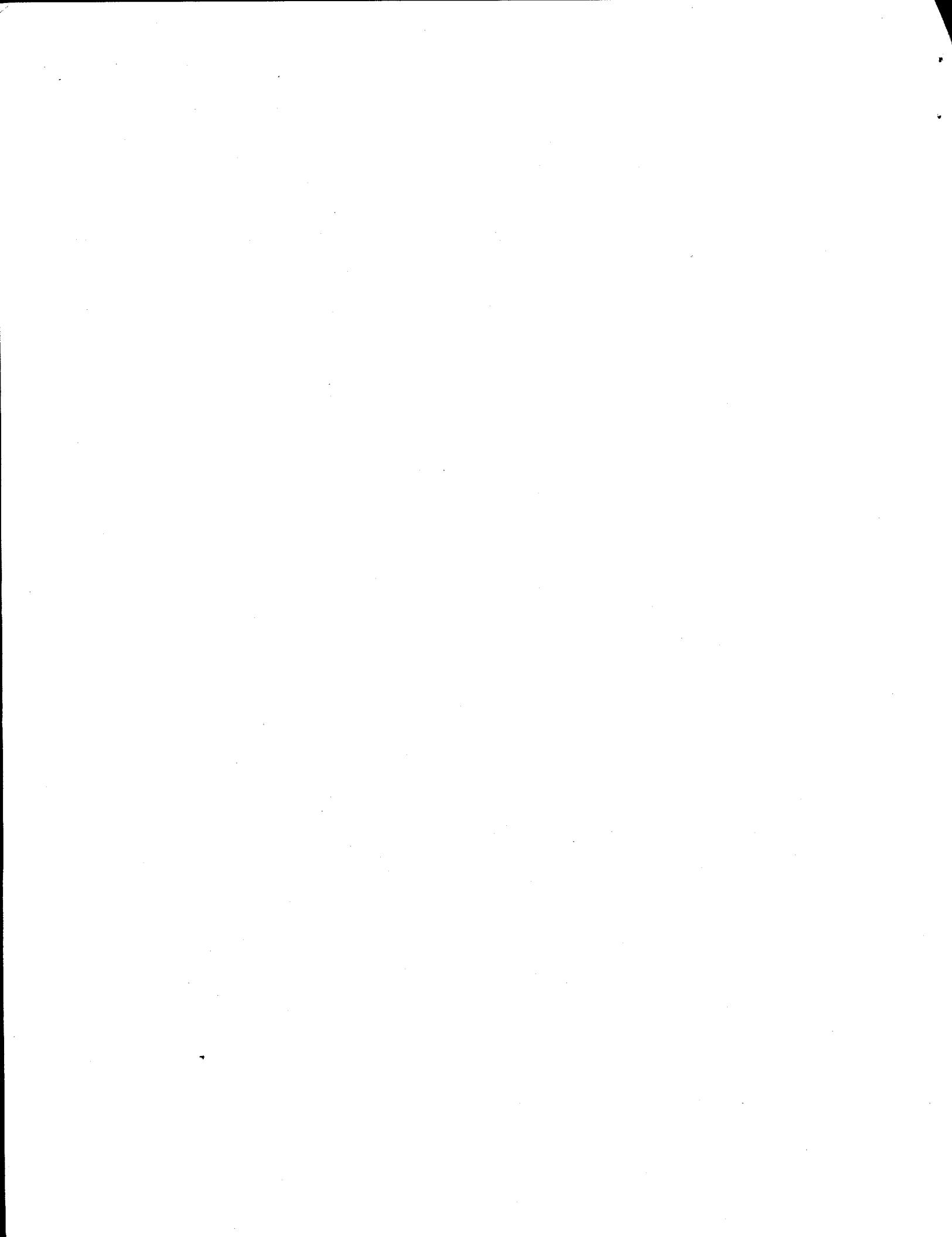
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## CONTENTS

	Page
Introduction-----	1
Types of data-----	3
Graphic generalization of data-----	3
Tabular data-----	4
Figures-----	6
Tables-----	26
Literature cited-----	88

## List of Figures

<u>Figure</u>	<u>Page</u>
1. A portion of Lower White Oak Lake Bed.....	6
2. ....do.,....depth of silty deposit.....	7
3. ....do.,....percentage of soil clay.....	8
4. ....do.,....0-6 inch sand and clay.....	9
5. Lake Bed soil mechanical analyses.....	10
6. A portion of Lower White Oak Lake Bed soil pH, 0-2 inches.....	11
7. ....do.,....soil pH, 2-6 inches.....	12
8. ....do.,....0-6 inch exchangeable calcium.....	13
9. ....do.,....0-6 inch exchangeable potassium.....	14
10. ....do.,....0-6 inch exchangeable magnesium.....	15
11. ....do.,....0-2 inch exchangeable cesium-137.....	16
12. ....do.,....0-2 inch total soil cesium-137.....	17
13. ....do.,....0-6 inch total soil cesium-137.....	18
14. ....do.,....0-2 inch total soil cobalt-60.....	19
15. ....do.,....0-6 inch total soil cobalt-60.....	20
16. ....do.,....calcium in <u>Carex</u> .....	21
17. ....do.,....potassium in <u>Carex</u> .....	22
18. ....do.,....magnesium in <u>Carex</u> .....	23
19. ....do.,....cesium-137 in <u>Carex</u> .....	24
20. ....do.,....cobalt-60 in <u>Carex</u> .....	25

## List of Tables

### Number

1. Chemical and physical data from the lake bed soil, 1958
2. Concentrations of elements and radionuclides of the lake bed soil, 1958
3. Concentrations of elements and radionuclides of the lake bed Carex, 1958
4. Chemical and physical data from the lake bed soil, 1958
5. Concentrations of elements and radionuclides of the lake bed soil, 1958
6. Concentrations of elements and radionuclides of the lake bed Carex, 1958
7. Chemical and physical data from the lake bed soil, 1958
8. Concentrations of elements and radionuclides of the lake bed soil, 1958
9. Concentrations of elements and radionuclides of the lake bed Carex, 1958
10. Chemical and physical data from the lake bed soil, 1958
11. Concentrations of elements and radionuclides of the lake bed soil, 1958
12. Concentrations of elements and radionuclides of the lake bed soil, 1958
13. Concentrations of elements and radionuclides in the lake bed Juncus, 1958
14. Concentrations of elements and radionuclides in the lake bed Salix
- 14A.pH, total cesium-137 and cobalt-60 in soil
15. Concentration of sodium, strontium and strontium-90 in the lake bed soil and Carex, 1958
- 15A.Content of the surface inches of lake bed soil, autumn, 1960
16. Plant taxa and parts used in chemical analyses of White Oak Lake Bed plants

## List of Tables

### Number

17. Percent carbon in lake bed plants
18. Percent nitrogen of lake bed plants
19. P.p.m. calcium of lake bed plants
20. P.p.m. potassium of lake bed plants
21. P.p.m. magnesium of lake bed plants
22. P.p.m. phosphorus of lake bed plants
23. P.p.m. sodium (1959) and strontium (1958) in lake bed plants
24. Strontium-90 in lake bed plants
25. Trivalent rare earths (1956-57), and cerium-144 (1957-58) in lake bed plants
26. Cesium-137 in lake bed plants
27. Cobalt-60 in lake bed plants
28. Ruthenium-106 and zirconium-niobium-95 in lake bed plants
29. Composition of plants from lake bed in 1959
30. Composition of plants from lake bed in 1959
31. Composition of Impatiens capensis from the lake bed in 1959
32. Composition of I. capensis from the lake bed in 1959
33. Composition of certain plants from the lake bed, 1960
34. Compositon of certain plants from the lake bed, 1960
35. Characteristics of Salix tree 15 from the lake bed, collected 22 October, 1960
36. 1956 and 1957 distribution of Salix stems diameters
37. 1958 distribution of stem diameters
38. 1959 distribution of stem diameters
39. 1960 distribution of stem diameters
40. 1959 and 1960 distribution of Salix stem diameters among trees between stakes 8D-8E-9D-9E

## List of Tables

### Number

41. Salix understory clip weights
42. Weights of leaves sampled three different years
43. Numbers of buds and weight of entire stems of Salix trees collected on lake bed, October, 1958
44. 1958 diameter measurements in mm at 50 cm height on Salix stems and measurement at breast height on the same tree
45. Characteristics of 27 Salix trees cut 22 October, 1960 on the lake bed near 31-0
46. Diameters at tenth to half meter intervals of Salix boles, October, 1960
47. Diameters at tenth to half meter intervals of Salix boles, October, 1960
48. Weight by species component of eight one square meter contiguous samples of the Polygonum stand, October, 1956
49. Samples number 1 and 2, of 17 May, 1957, and number 3 and 4, of 7 June, 1957
50. Weight of 1600 square cm samples of herb community and litter, October, 1957
51. Weight of 1600 square cm samples of herb community and litter, October, 1959
52. Weight of 1600 square cm samples of herb and litter, October, 1958
53. Weight of 1600 square cm herb and litter samples, October, 1958
54. Weights of 1600 square cm herb and litter samples by important component, October, 1959
55. Weights of 1600 square cm herb and litter samples by important component, October, 1959
56. Weights of 1600 square cm herb and litter samples by important component, October, 1959
57. Clips of Carex and Juncus, February, 1959

List of Tables

Number

58. Weights of herb and litter samples by important component, October, 1960
59. Weights of herb and litter samples each of 1600 square cm area, by important component, October, 1960
60. Weights of 1600 square cm herb and litter samples by important component, October, 1960
61. Weights of 1600 square cm herb and litter samples by important component, October, 1960
62. Calories per gram dry weight of selected lake bed plants, 1958, 1959, 1960.

## INTRODUCTION

The data organized and presented herewith have been accumulated during the first five years after the drainage of White Oak Lake, which was a part of the radioactive waste disposal system of the Manhattan Project and the Oak Ridge National Laboratory during the twelve years prior to the lake's drainage in 1955. Studies based on the data have been presented separately (DeSelm and Shanks, 1961a, b; Shanks and DeSelm, 1961). This report performs the dual function of making available the basic data of these published reports and of documentation of further details of the early history of this interesting and significant radioactive waste disposal area.

The sampling area, a 3-acre portion of the lake bed which was selected for maximum surface uniformity, is shown in figures 1-4 and 6-20, and has been described elsewhere (DeSelm and Shanks, 1961b; Shanks and DeSelm, 1961). Sampling stations are indicated in many of the tables by reference to stakes located at 10-meter intervals on a rectangular grid, shown on many of the figures and designated by number and letter coordinates..

Field and laboratory procedures detailed elsewhere (DeSelm and Shanks, 1961b) accomplished intensive systematic sampling, by location and by year, of plants and soils and some of their chemical and physical properties reported in the tables.

The advice and assistance of a number of University of Tennessee colleagues are acknowledged: F. H. Norris, G. E. Hunt, and A. J. Sharp of the Botany Department; L. F. Seatz, W. L. Parks, M. E. Springer, O. H. Long, and J. K. Underwood of the Agronomy Department; Robert McIlhenny and Leo Hardin of the Agricultural Experiment Station; and John Dean of the Chemistry Department.

Sharp, Underwood, and Peter Hyypio of the University of Michigan assisted in the identification of plant specimens. Nomenclature used is essentially that of Gray's Manual (Fernald, 1950).

The field work was carried out with the assistance of the following graduate students, employed as research assistants on the project: John T. McGinnis, John P. Witherspoon, David Mulcahy, and Jerry C. Ritchie. They also assisted in laboratory phases of the work.

The soil mechanical analyses were done mainly by Robert Rusk; Martha Corry and Ray Clift assisted with graphics; and Noell Wilson, Lewis Bledsoe, and Arnold Schwartzbart assisted in preparation of samples for chemical analysis and in many other ways.

As noted in many of the tables, much of the analytical work was carried out by Mrs. Jane McCarthy and James Wolfe, whose competence contributed notably to the success of the project.

Mrs. McCarthy did the 1958 cobalt-60 and cesium-137 gamma spectrometry and Mr. Wolfe did most of the other chemical analyses (tables 1-30). Part of the 1958 and 1959 laboratory work was carried out at the University of Tennessee--U.S. Atomic Energy Commission Laboratory at Oak Ridge. Subsequent laboratory work has been done in the botanical laboratories at the University. Earlier analyses (1956-57) were performed by the analytical divisions of Oak Ridge National Laboratory except the 1956 carbon analyses which were done at the now defunct Knoxville Chemical-Medical Laboratory.

At ORNL carbon, nitrogen, calcium, potassium and phosphorus determinations were done in the laboratory of W. R. Laing; strontium-90, trivalent rare earths, and cerium-144 were done

(1956-58) under the supervision of E. I. Wyatt; strontium-90 (1959-60) in the Low Level Laboratory under the supervision of C. L. Burros; and the 1956-57 cobalt-60, cesium-137, ruthenium-106, and zirconium-niobium-95 by T. H. Handley.

#### TYPES OF DATA

Two kinds of data are reported here. The tables which make up the bulk of the report consist solely of untreated data. The only computed figures included are the averages in tables 50-61. The results of other computations from these data appear in the papers previously cited. Also presented is a series of maps of a portion of Lower White Oak Lake Bed on which is generalized the distribution of values of certain physical and chemical soil and plant variables. These maps interpret in pattern form, with generalized isopleths, the data in tables 1-12.

#### GRAPHIC GENERALIZATION OF DATA

A map of the area under study was prepared in 1957 by DeSelm and McGinnis and in 1959 the elevations corrected by DeSelm (figure 1). This is the base map of figures 1-4 and 6-20. Figures 2-4 depict the distribution of the silty lacustrine surface soil, and the sand and clay, while in figure 5 the results of about 280 mechanical analyses of the soil at 0-2 and 2-6 inches depth are shown (converted to 0-6 inches assuming bulk densities of the two layers to be the same). Figures 6-15 depict the distribution of chemical soil characters, the distribution of pH, exchangeable calcium, potassium, magnesium, cesium-137, and total cesium-137 and total cobalt-60.

The general similarity between the distribution of soil clay, pH, calcium, magnesium, and the radiocontaminants cesium-137 and

cobalt-60 is at once apparent. It is also notable that major areas on the maps are covered by concentrations of cesium-137 and cobalt-60, which vary by a factor of more than 5. Other chemical factors exhibit less wide variation on the area. In Carex variation between plants on different sites is not large, that of greatest magnitude being the five-fold variation in cesium-137.

Figures 16-20 depict the concentrations of the substances in Carex. Variations in concentrations of exchangeable soil minerals and the corresponding Carex values are far from parallel. A very general agreement exists in calcium, with plant and soil concentrations at the same level. General agreement also exists in magnesium, although Carex concentrations are ten times those on the soil exchange. The potassium maps are dissimilar both with respect to level and distribution of concentrations. Distribution of total soil and Carex cesium-137 is generally parallel, the concentrations differing by a factor of about 50 to 100. This relationship, and the relationship between plant concentrations of cesium-137 and the entire series of plant and soil variables investigated has been examined in detail by multiple regression technique and reported elsewhere (Shanks and DeSelms, 1961).

Soil and plant cobalt-60 values are only slightly similar in their distribution. Soil concentrations exceed those in Carex by factors of 200 to 600.

#### TABULAR DATA

The tables may be thought of as being organized into two groups. Tables 1-35 are concerned with chemical and physical data on soil or plants. Tables 36-61 relate to the characteristics of the vegetation, especially with respect to production per unit

area and composition of clip samples. Table 62 summarizes available information on caloric content of lake bed plants.

Tables 1-12 list chemical and physical data collected at grid points in the area. Soil collections (April-June, 1958) were made within one meter of the designated stake. Corresponding collections of Carex frankii and/or Juncus effusus var. solutus (table 13) are from the same or an adjacent square meter and were collected 13 June, 1958. Some small trees of Salix nigra were also collected (table 14). Some short series plant and soil chemical data appear in tables 14A-15A. Beginning in table 16 and extending through table 28 are chemical data accumulated over the five year period for 39 plant taxa. Where replication occurs, the data may appear in the table legend or, if more extensive, may appear in tables 29 through 34. Table 35 includes both chemical analytical and mensurational data from one Salix tree.

Tables 36-40 detail the diameter distribution of Salix stems found on the lake bed; 41 and 42 understory and Salix leaf weights; 43 and 44 the 1958 DBH, weight, and bud number data used in calculating regressions by DeSelms and Shanks (1961b). The mensurational data on 27 Salix trees cut in 1960 are shown in tables 45-47.

Tables 48-61 detail the weight data from clips of herbaceous plant communities, 1956-1960. Tables 48(1956) and 54-61 (1959-60) show weights by taxonomic component. Tables 49-53 (1957-58) show live (fresh) material undifferentiated. All include weights of accumulated litter although in some samples it was so obviously contaminated by flood-brought soil fines that washing was essential (tables 54 and 55).

# A PORTION OF LOWER WHITE OAK LAKE BED

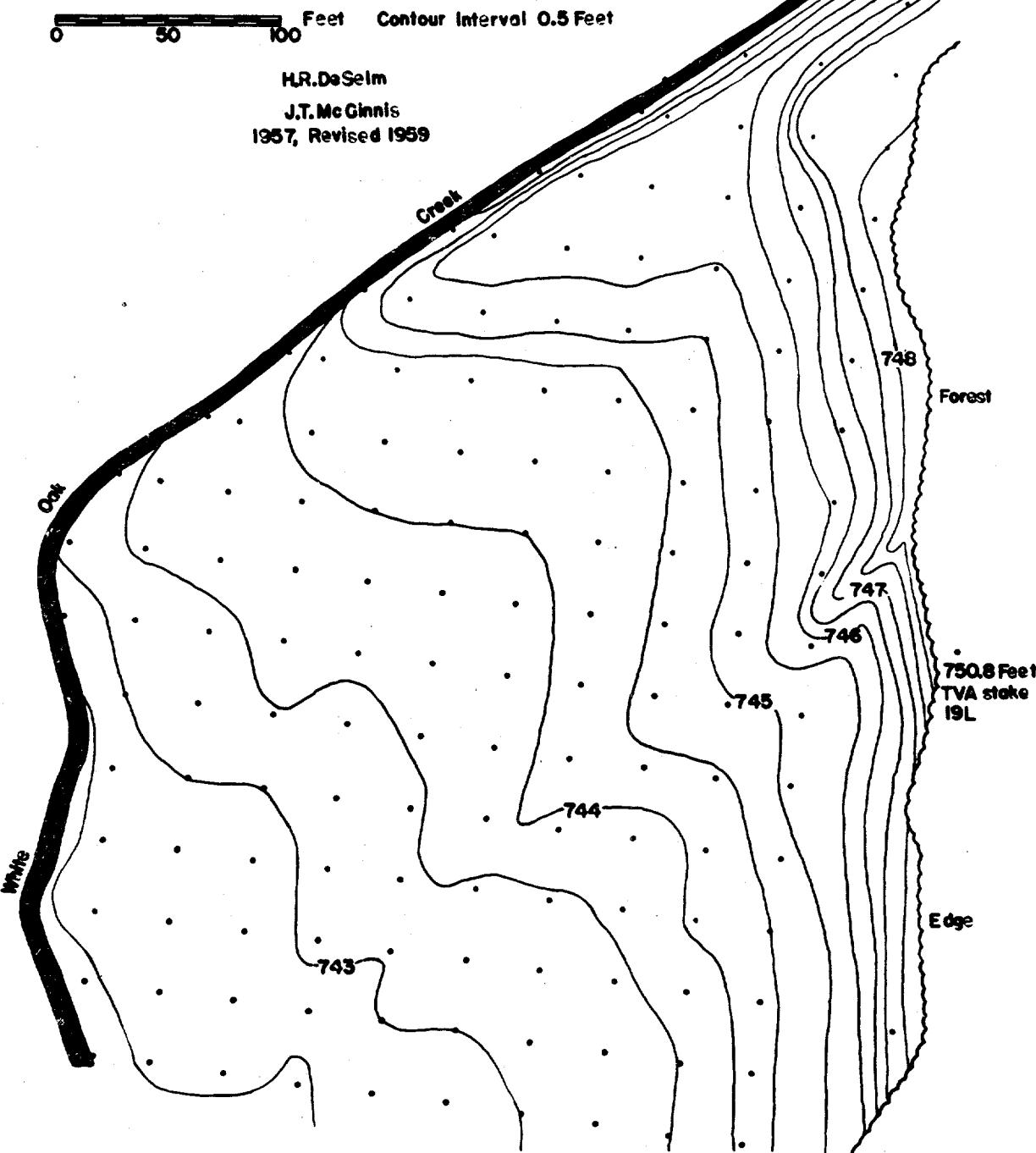


Figure 1. A portion of Lower White Oak Lake Bed

# A PORTION OF LOWER WHITE OAK LAKE BED

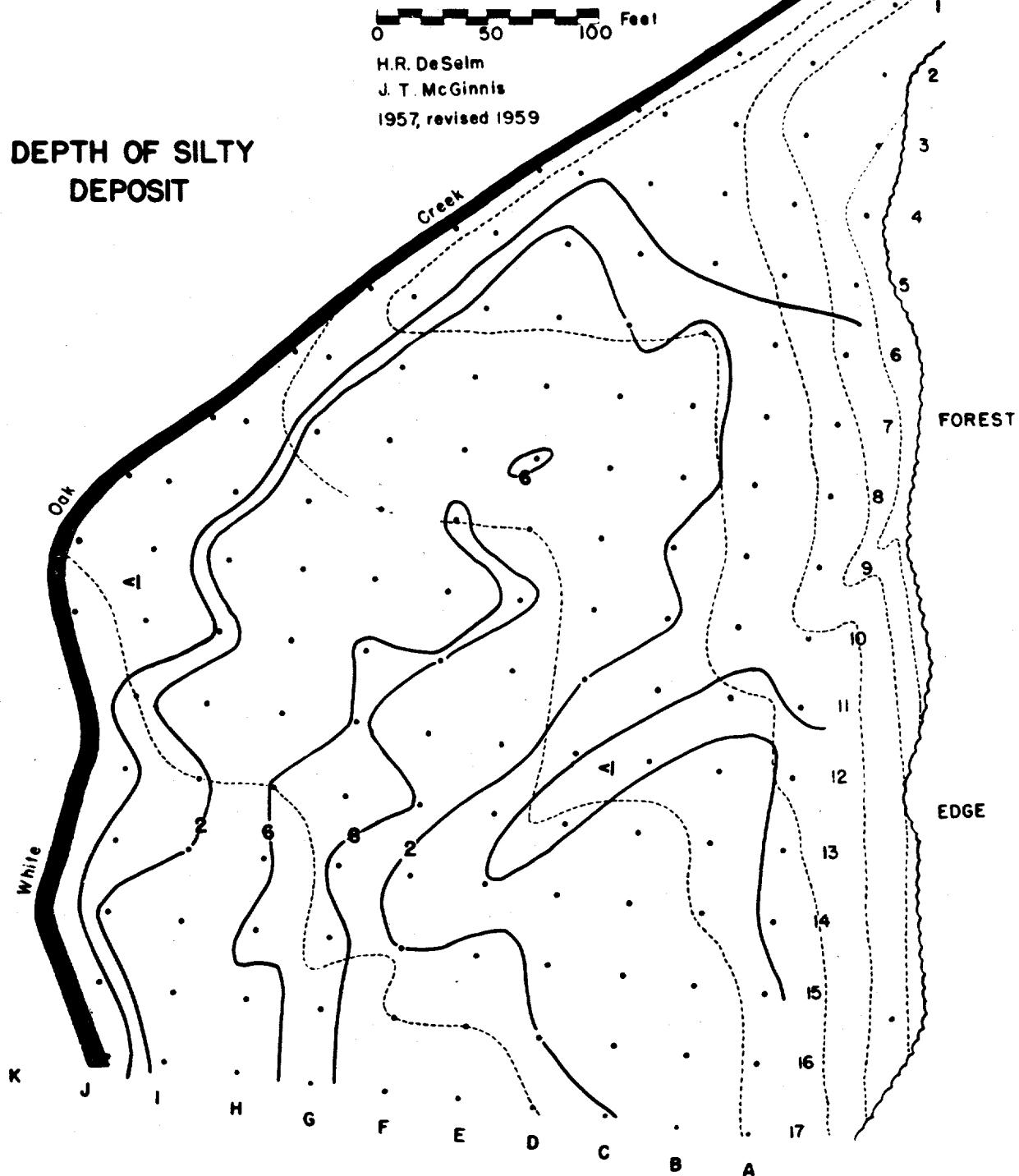


Figure 2. Depth of silty deposit in inches

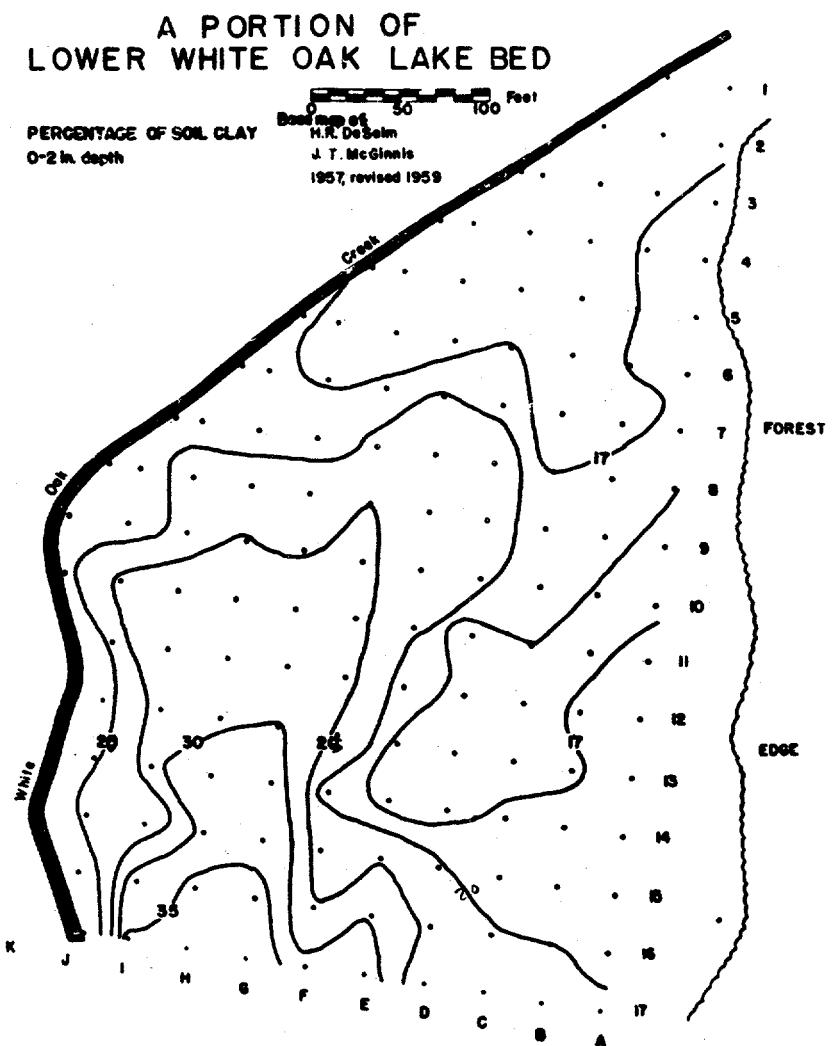


Figure 3. Percentage of soil clay, 0-2 inches depth

# A PORTION OF LOWER WHITE OAK LAKE BED

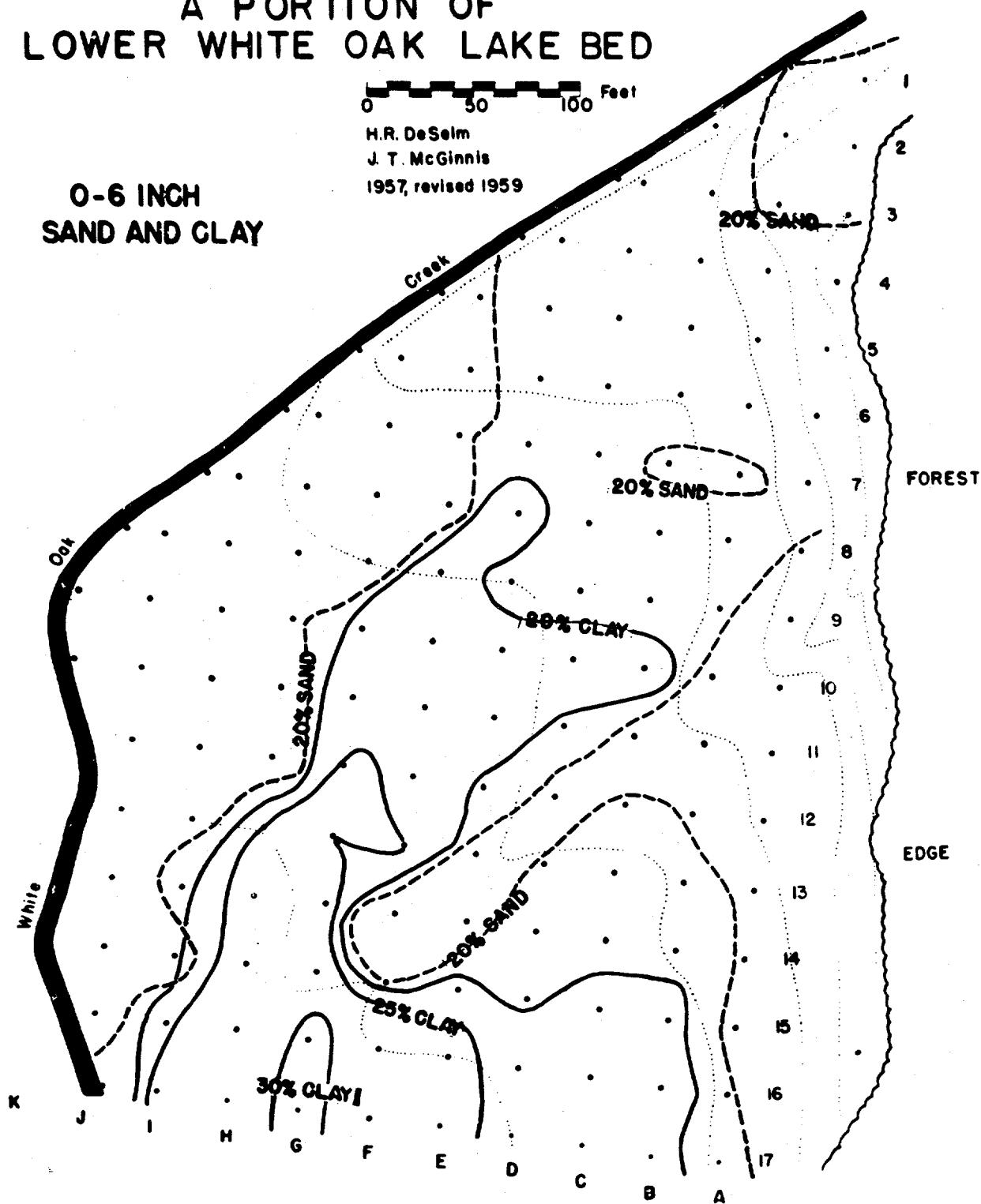


Figure 4. Soil 0-6 inch percent sand and clay

10

00

**Lake Bed Soil****Mechanical Analyses****0-6 inches depth****Percent Silt****Percent Clay****Silty clay loam****Loam****Silt loam****Percent Sand**

100

0

00

0

Figure 5. Lake Bed soil mechanical analyses

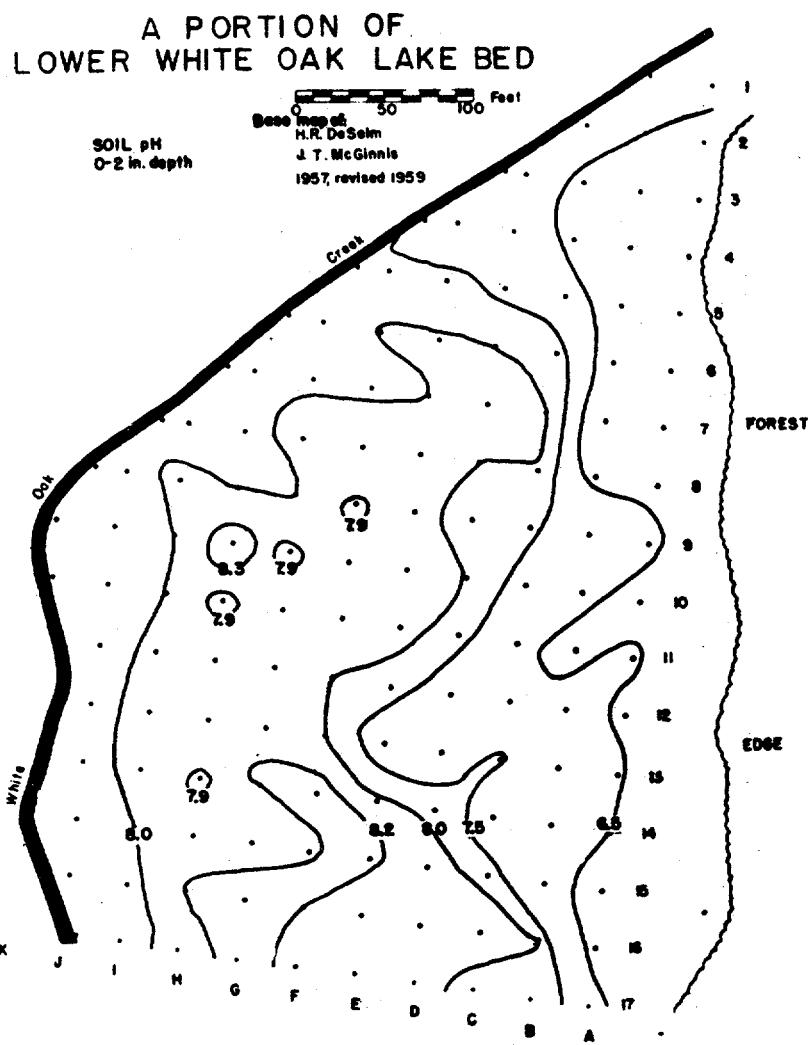


Figure 6. Soil pH, 0-2 inches depth

# A PORTION OF LOWER WHITE OAK LAKE BED

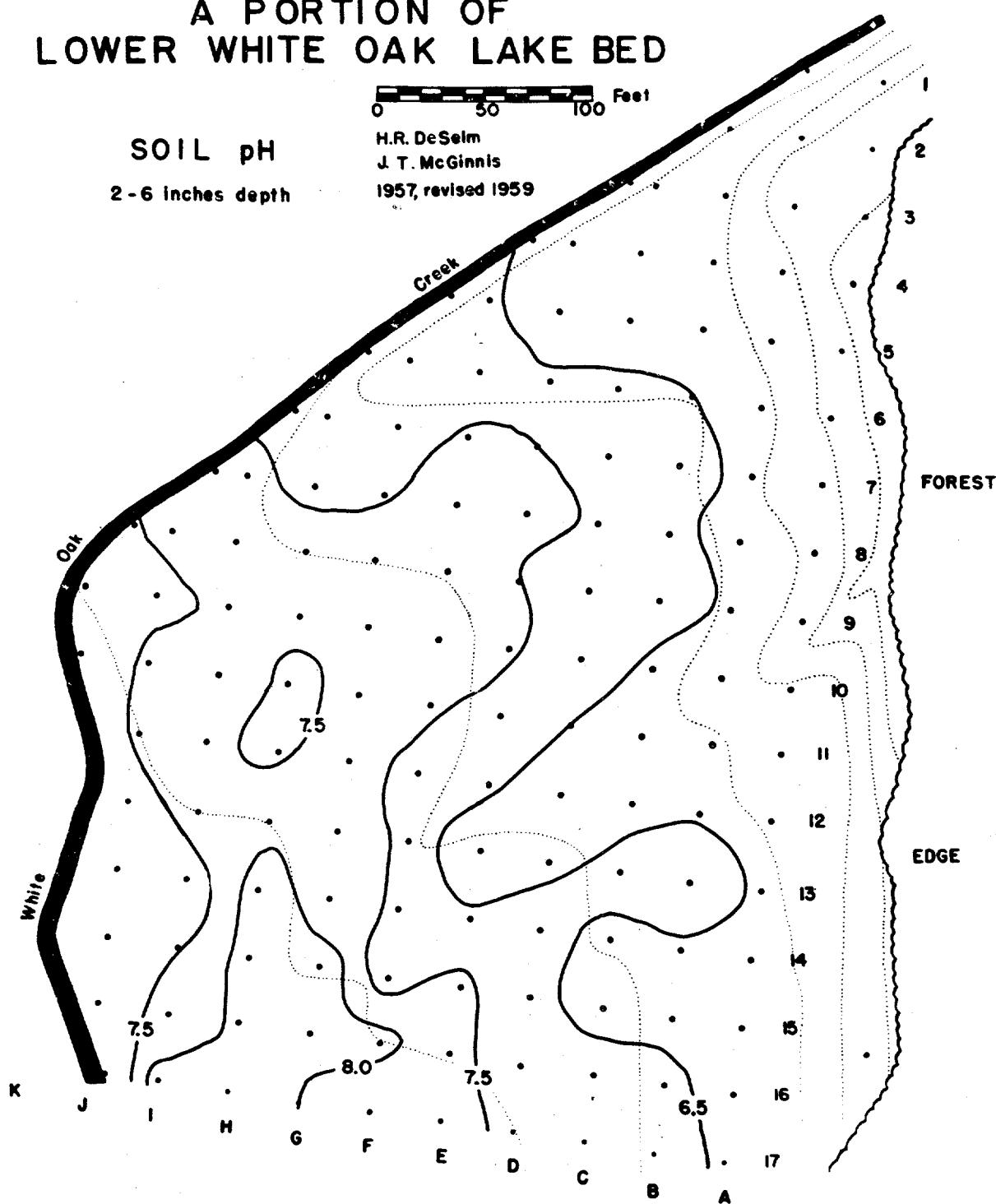


Figure 7. Soil pH, 2-6 inches depth

A PORTION OF  
LOWER WHITE OAK LAKE BED

0 50 100 Feet

H.R. DeSelm  
J.T. McGinnis  
1957, revised 1959

0-6 INCH  
EXCHANGEABLE  
CALCIUM

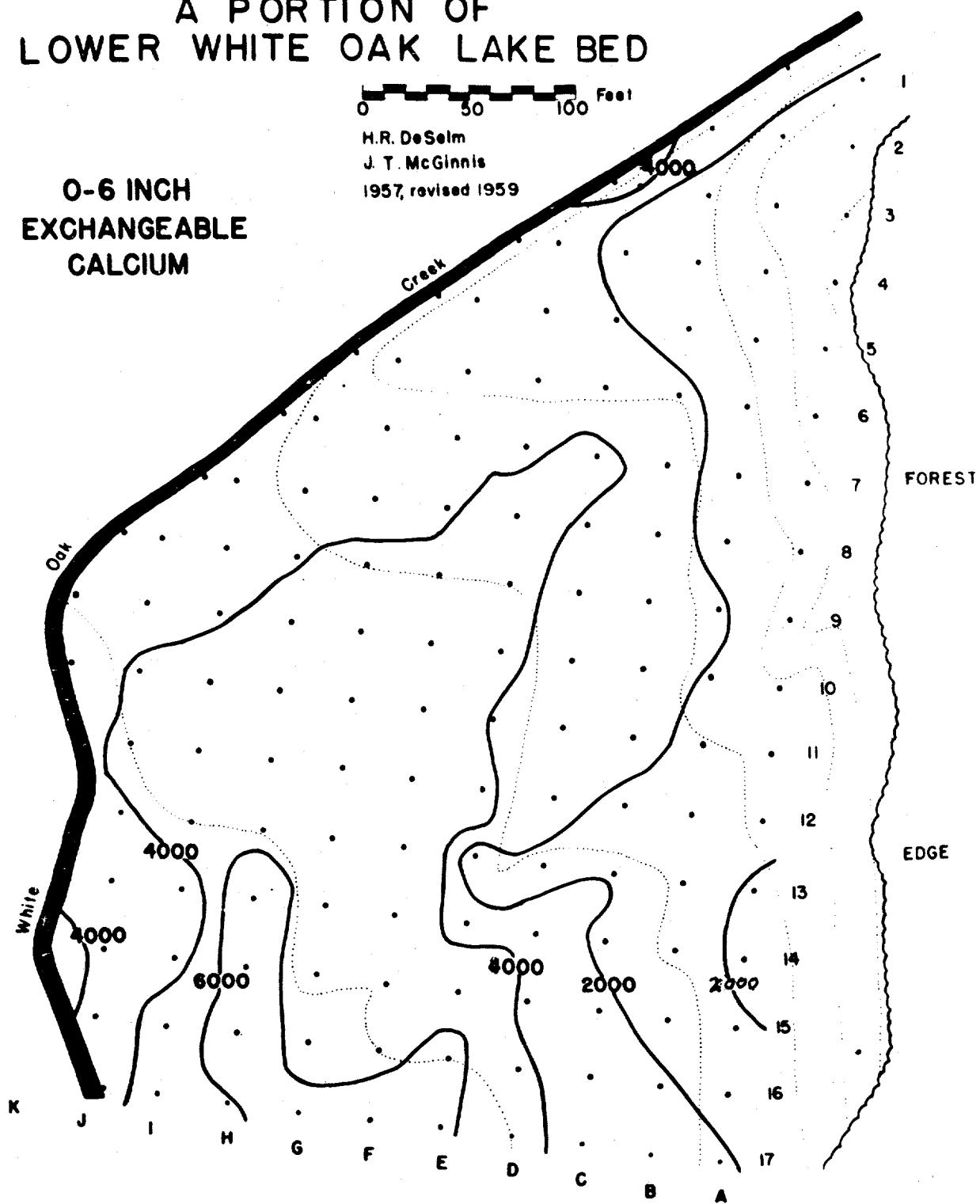


Figure 8. Soil 0-6 inch exchangeable calcium in p.p.m.

# A PORTION OF LOWER WHITE OAK LAKE BED

0 50 100 Feet

H.R. DeSelm  
J.T. McGinnis  
1957, revised 1959

0-6 INCH  
EXCHANGEABLE  
POTASSIUM

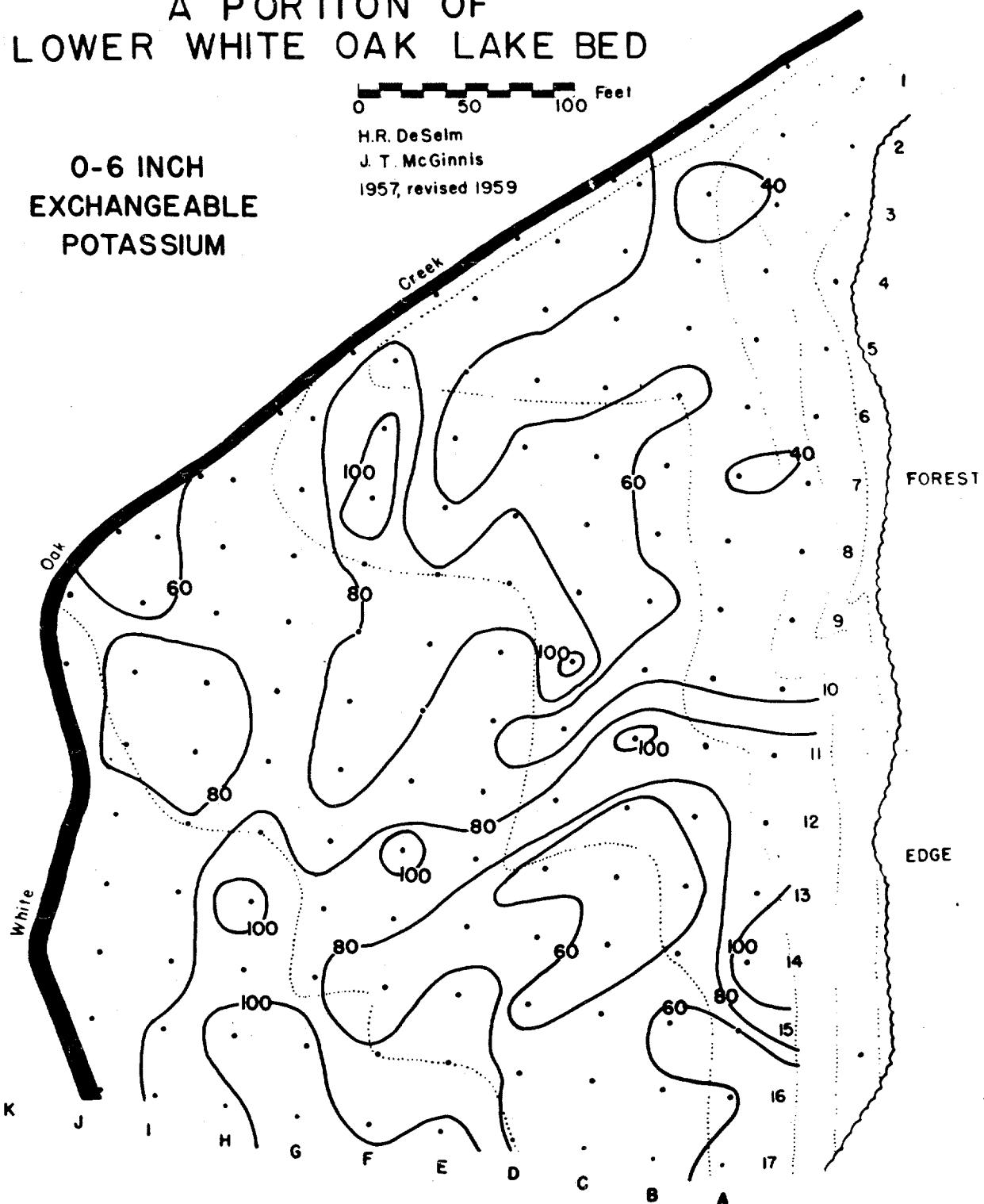


Figure 9. Soil 0-6 inch exchangeable potassium in p.p.m.

A PORTION OF  
LOWER WHITE OAK LAKE BED

0-6 INCH  
EXCHANGEABLE  
MAGNESIUM

0 50 100 Feet

H.R. DeSelm  
J.T. McGinnis  
1957, revised 1959

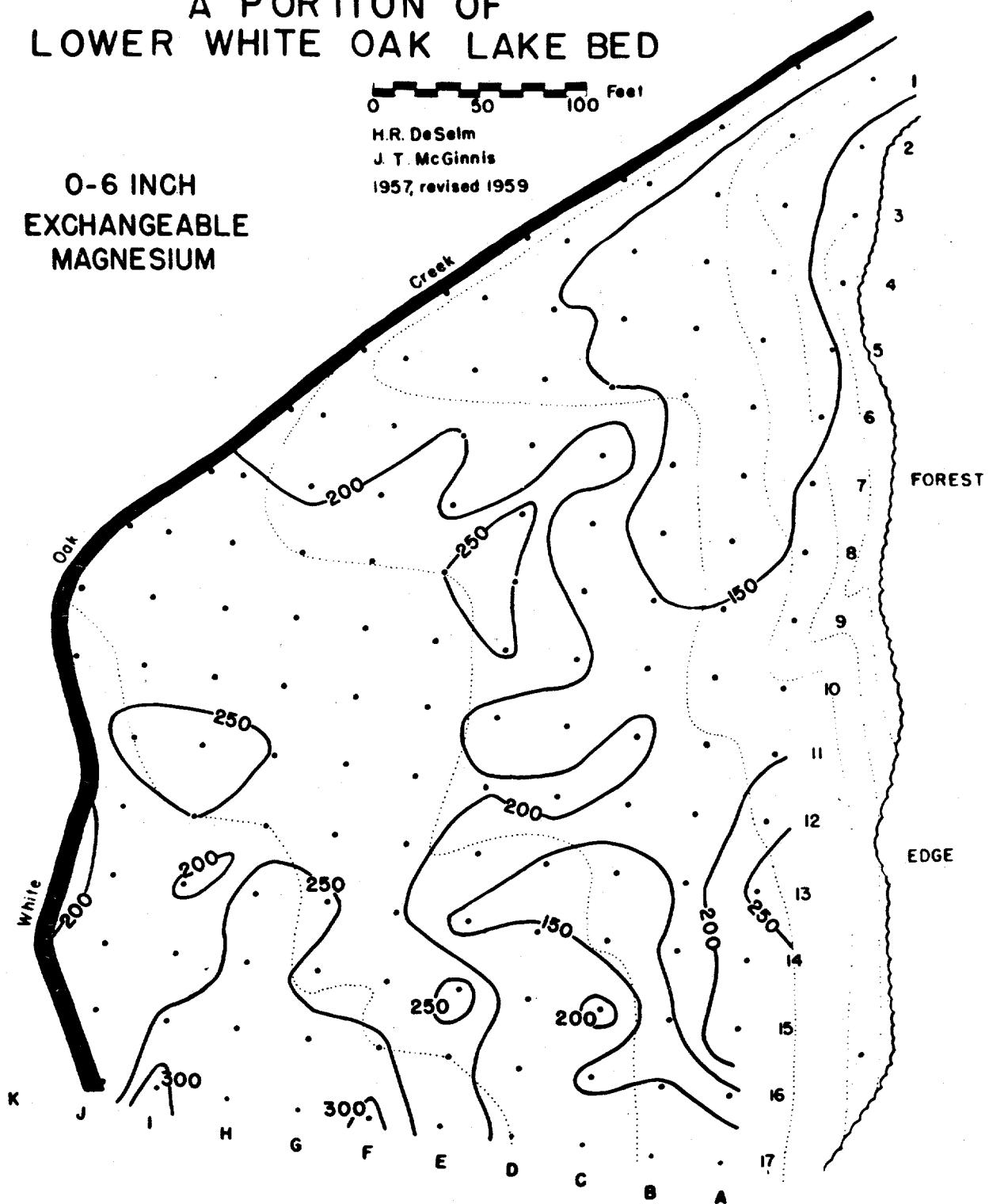


Figure 10. Soil 0-6 inch exchangeable magnesium in p.p.m.

A PORTION OF  
LOWER WHITE OAK LAKE BED

0 50 100 Feet

H.R. DeSelms  
J. T. McGinnis  
1957, revised 1959

0-2 INCH  
EXCHANGEABLE  
CESIUM-137

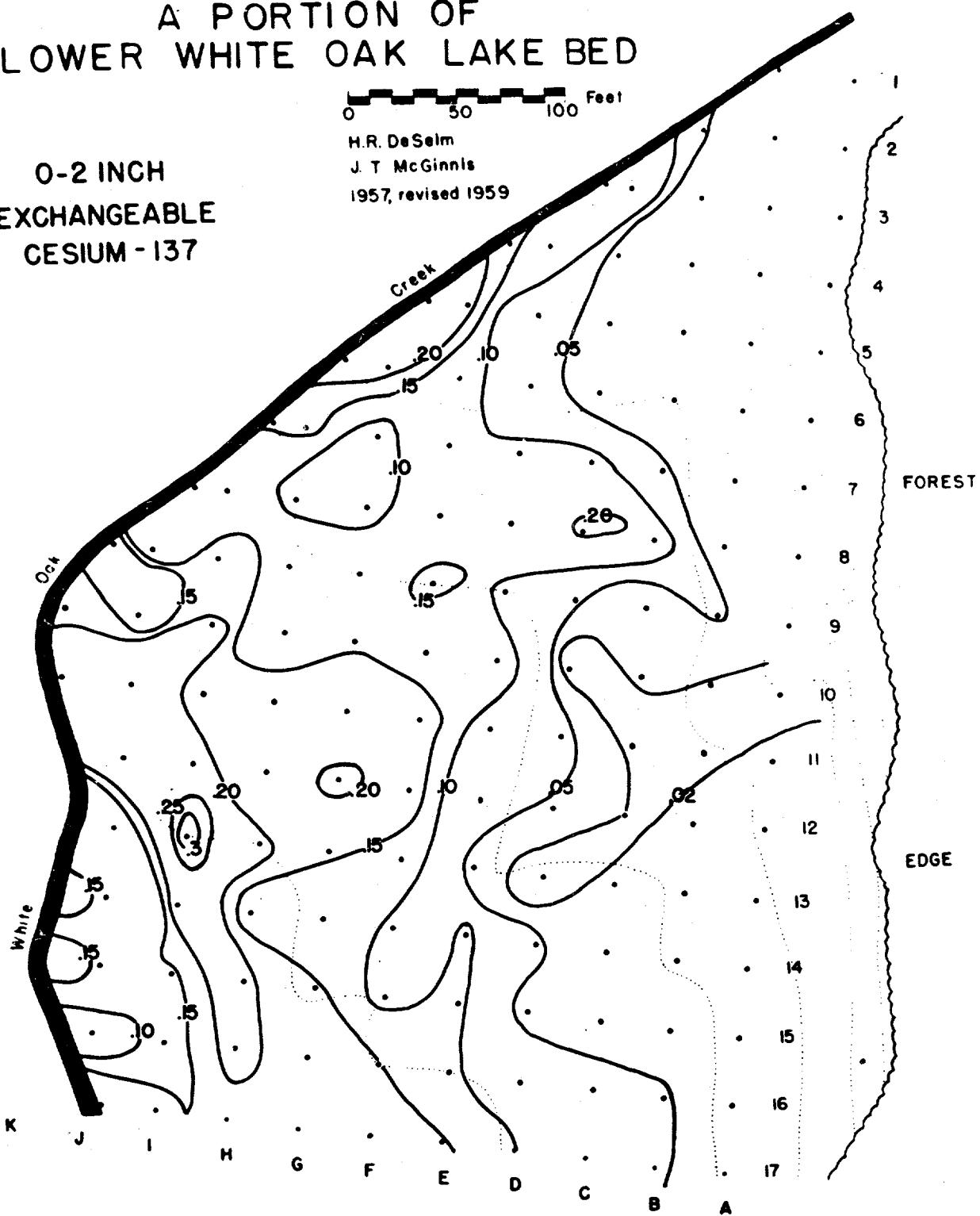


Figure 11. Soil 0-2 inch exchangeable cesium-137 in  $\mu\text{c}$  per  
100 grams

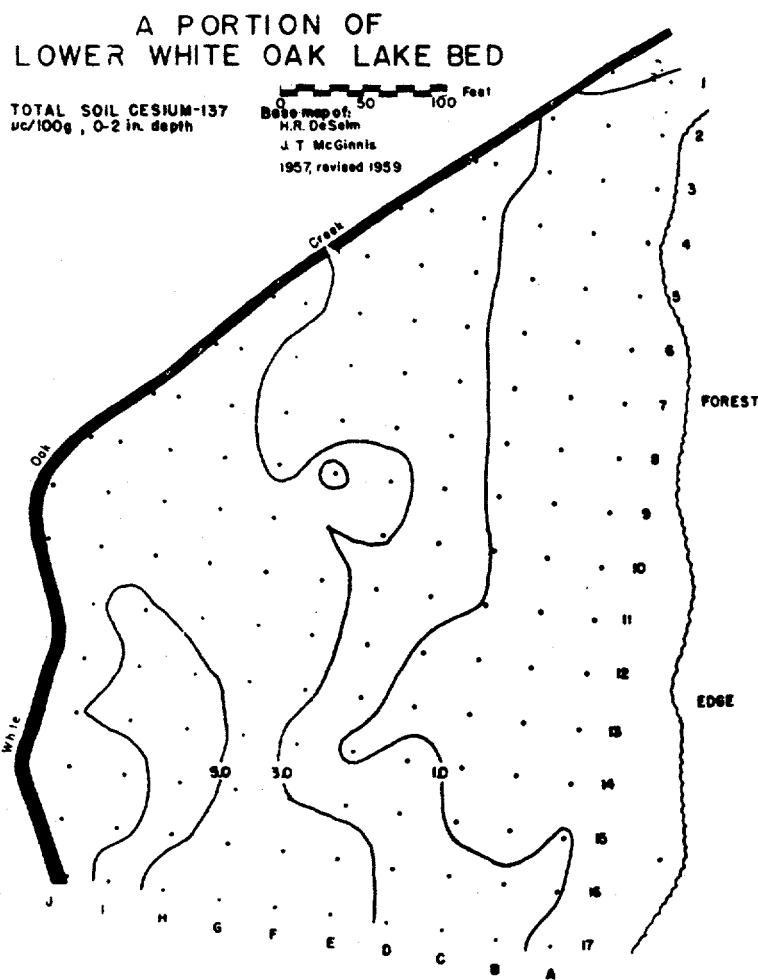


Figure 12. Total soil cesium-137, 0-2 inches depth in  $\mu$ c per  
100 grams

# A PORTION OF LOWER WHITE OAK LAKE BED

0 50 100 Feet

H.R. DeSelms  
J.T. McGinnis  
1957, revised 1959

TOTAL SOIL CESIUM-137  
0-6 INCHES

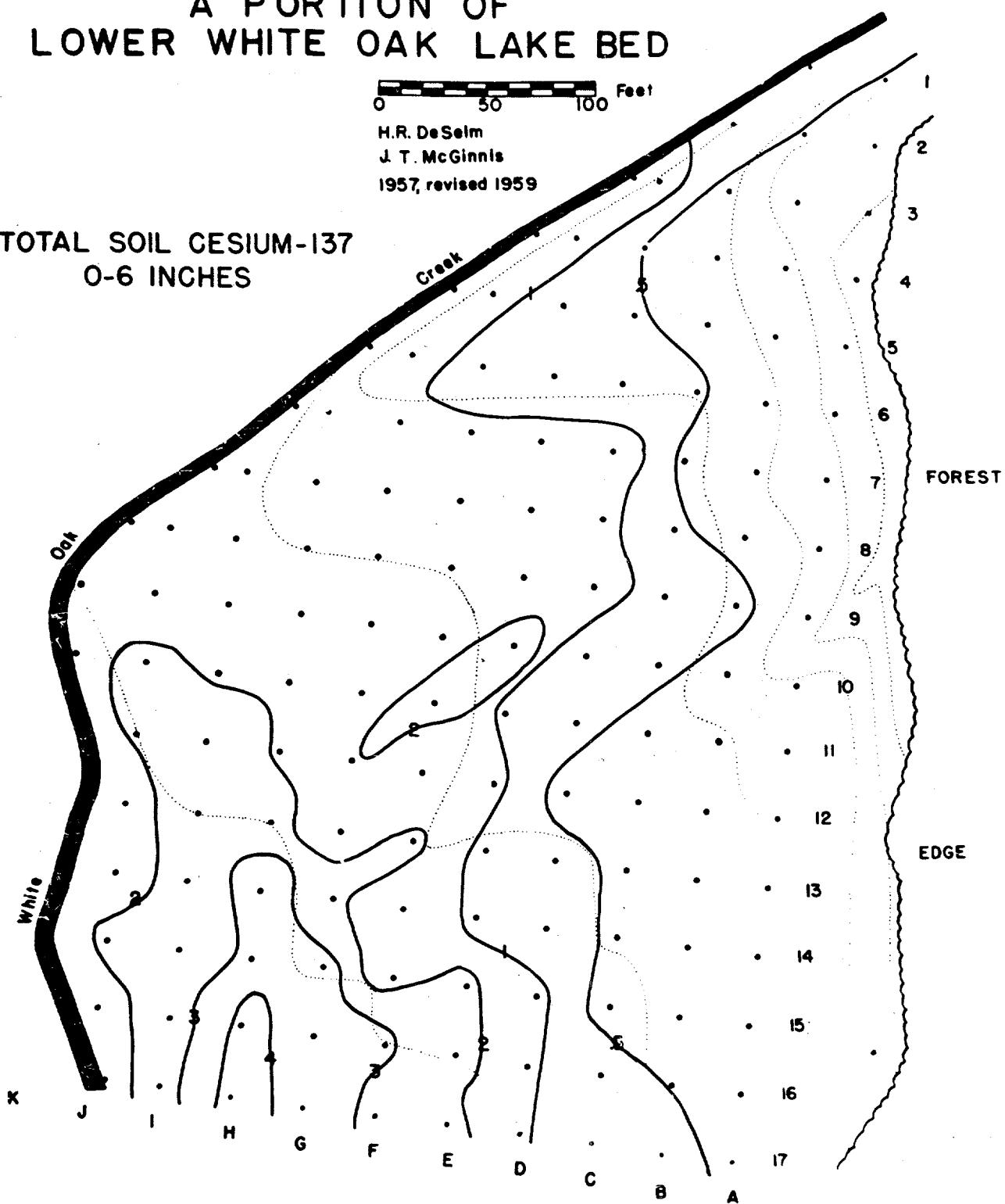


Figure 13. Soil 0-6 in total cesium-137 in  $\mu$ c per 100 grams

# A PORTION OF LOWER WHITE OAK LAKE BED

0 50 100 Feet

H.R. DeSelms  
J.T. McGinnis  
1957, revised 1959

TOTAL SOIL COBALT-60  
0-2 INCHES

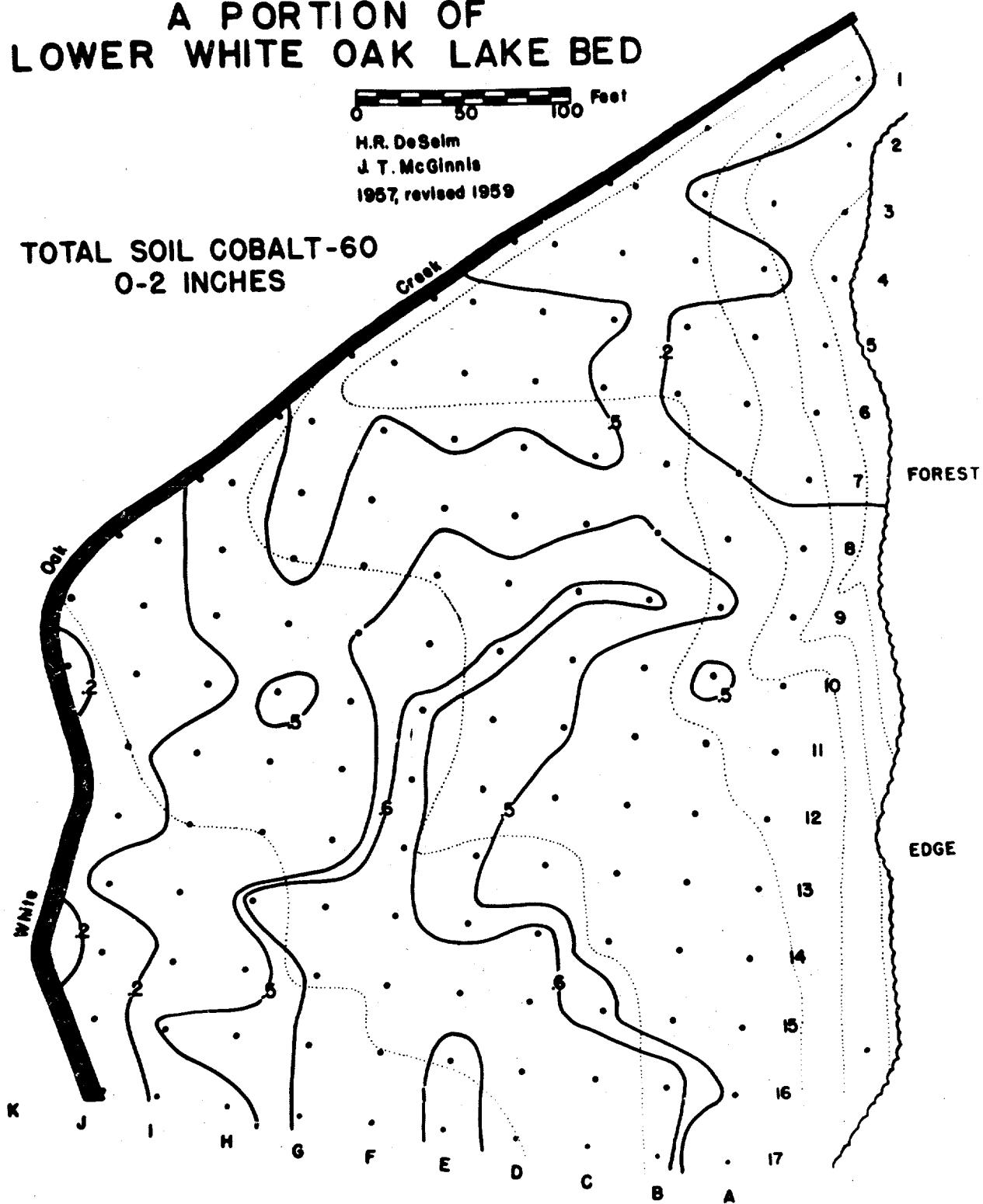


Figure 14. Soil 0-2 inch total cobalt-60 in  $\mu\text{c}$  per 100 grams

# A PORTION OF LOWER WHITE OAK LAKE BED

0 50 100 Feet

H.R. DeSelm  
J.T. McGinnis  
1957, revised 1959

TOTAL SOIL COBALT-60  
0-6 INCHES

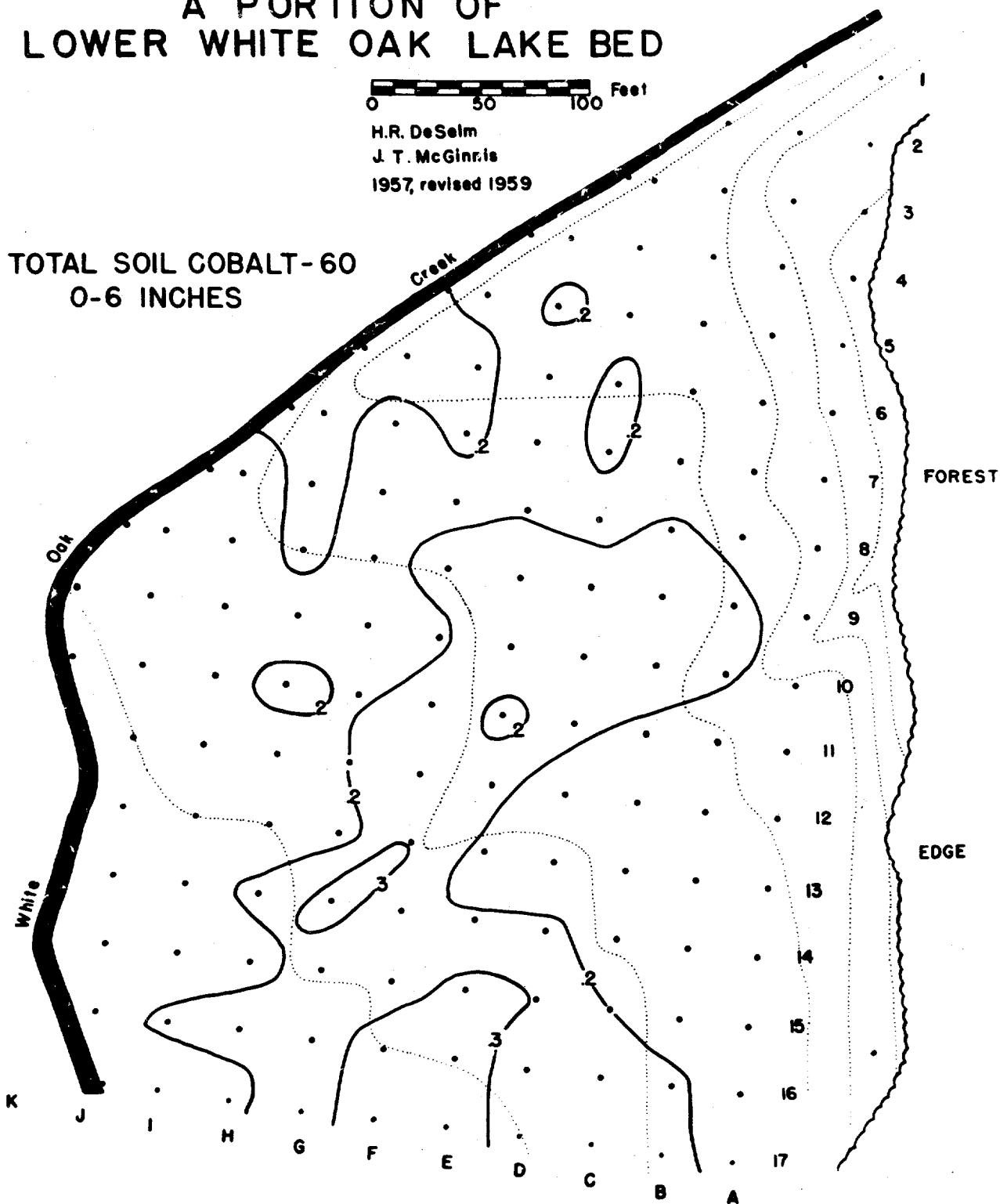


Figure 15. Soil 0-6 inch total soil cobalt-60 in  $\mu\text{c}$  per 100 grams

## A PORTION OF LOWER WHITE OAK LAKE BED

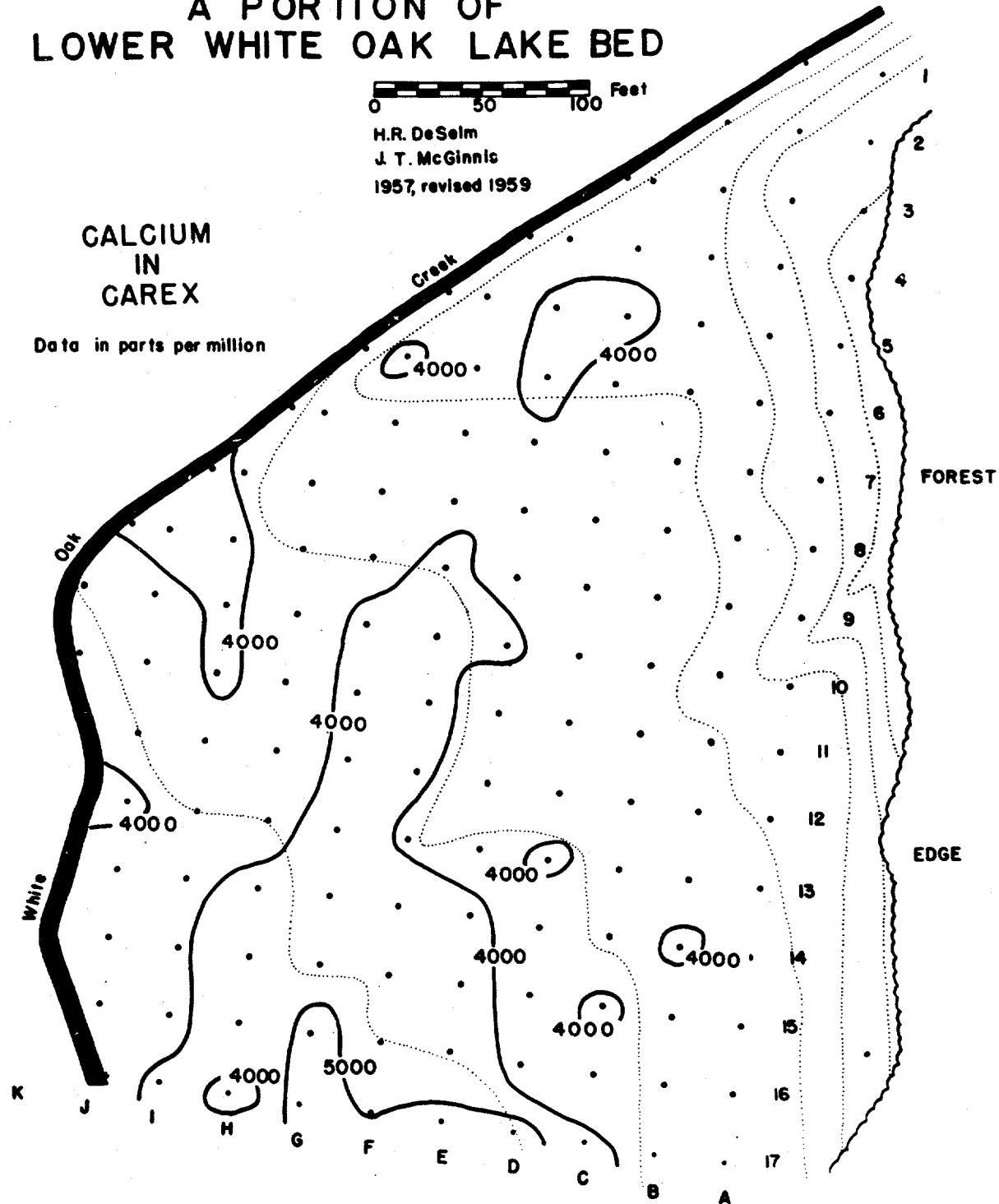


Figure 16. P.p.m. calcium in Carex

# A PORTION OF LOWER WHITE OAK LAKE BED

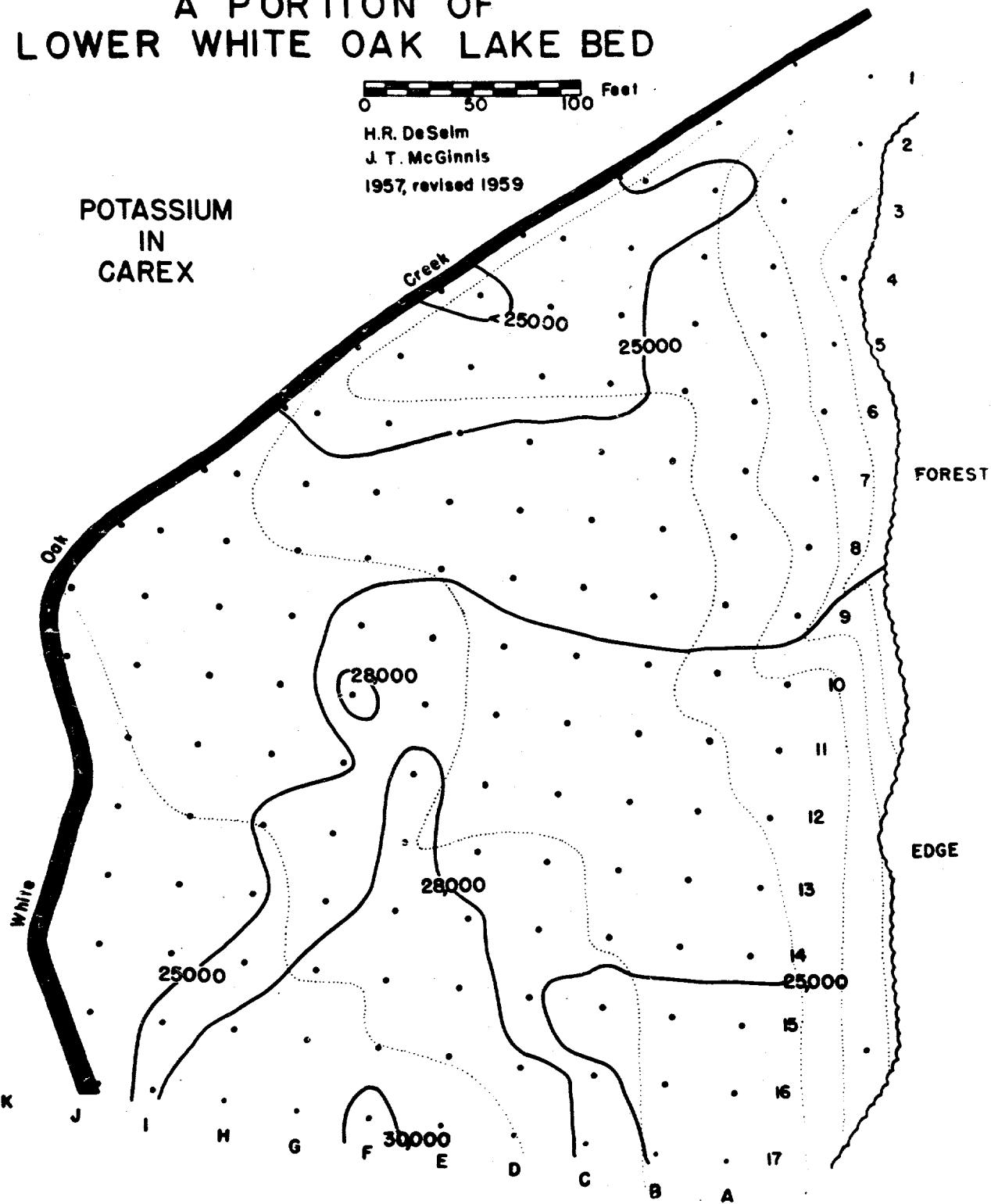


Figure 17. P.p.m. potassium in Carex

# A PORTION OF LOWER WHITE OAK LAKE BED

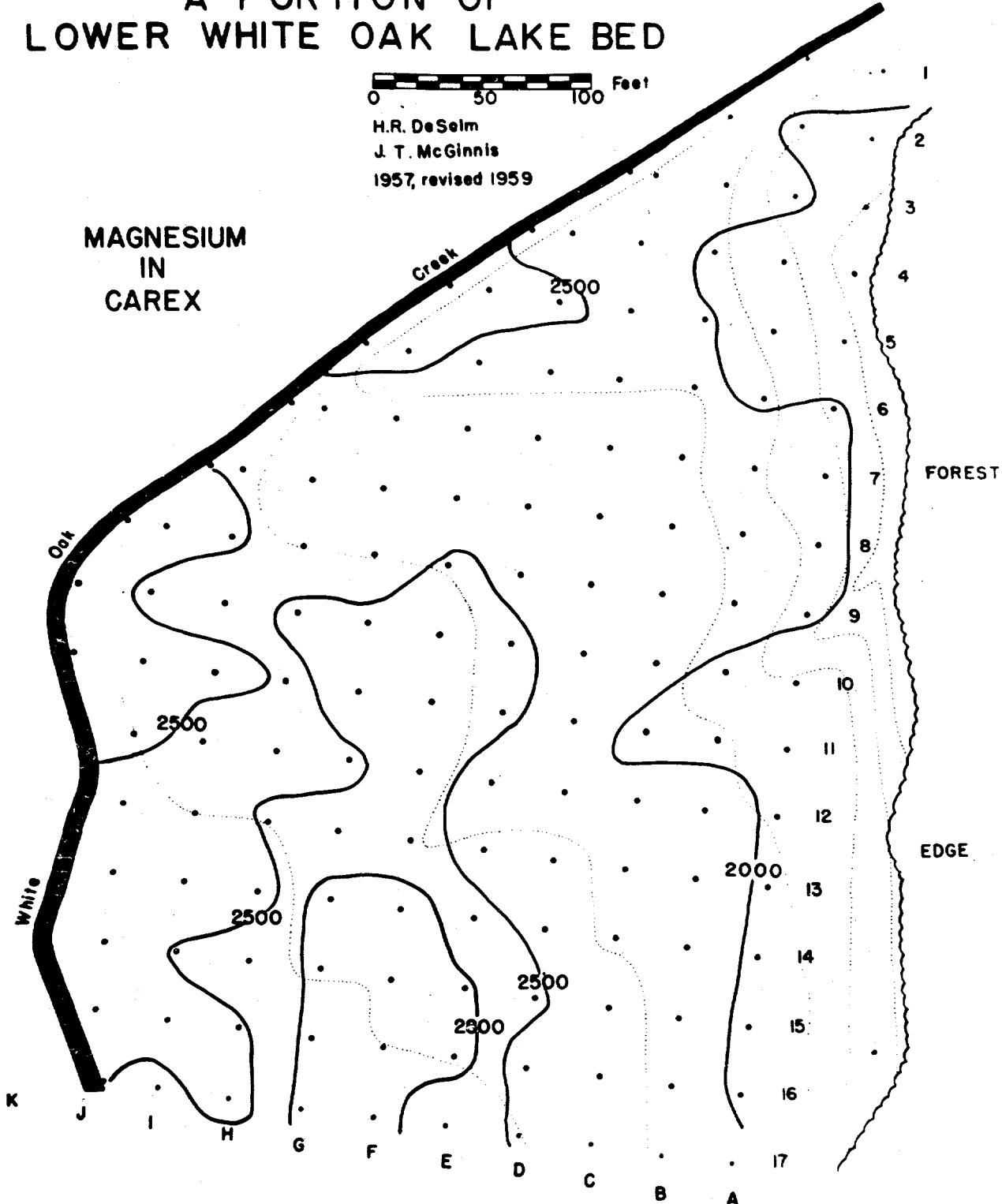


Figure 18. P.p.m. magnesium in Carex

## A PORTION OF LOWER WHITE OAK LAKE BED

CESIUM-137  
IN  
CAREX

Data in microcuries  
per 100 grams

0 50 100 Feet

H.R. DeSelms  
J.T. McGinnis  
1957, revised 1959

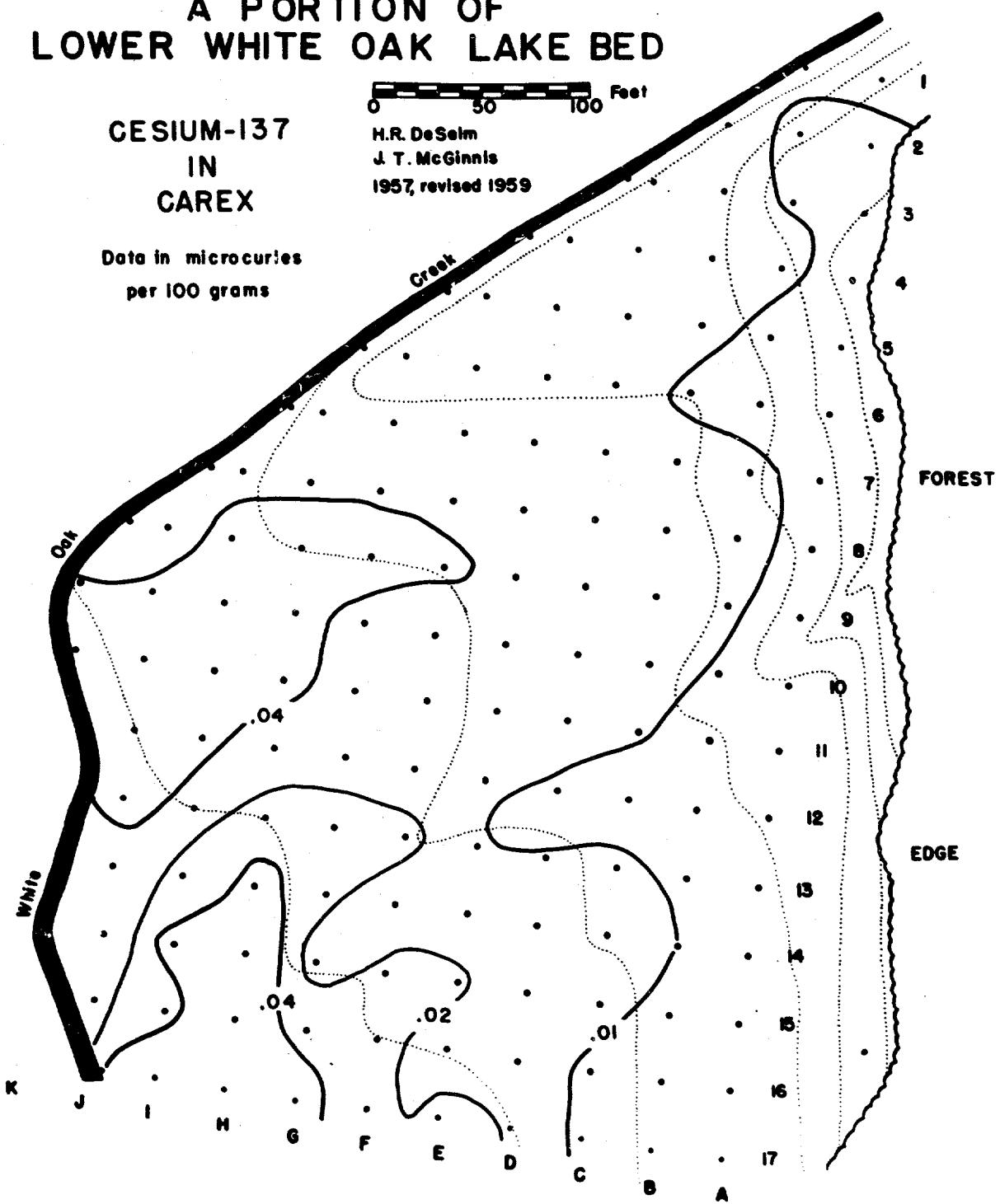


Figure 19. Cesium-137 in Carex,  $\mu\text{c}$  per 100 grams

# A PORTION OF LOWER WHITE OAK LAKE BED

## COBALT-60 IN CAREX

Data in microcuries  
per 100 grams

0 50 100 Feet

H.R. DeSelm  
J.T. McGinnis  
1957, revised 1959

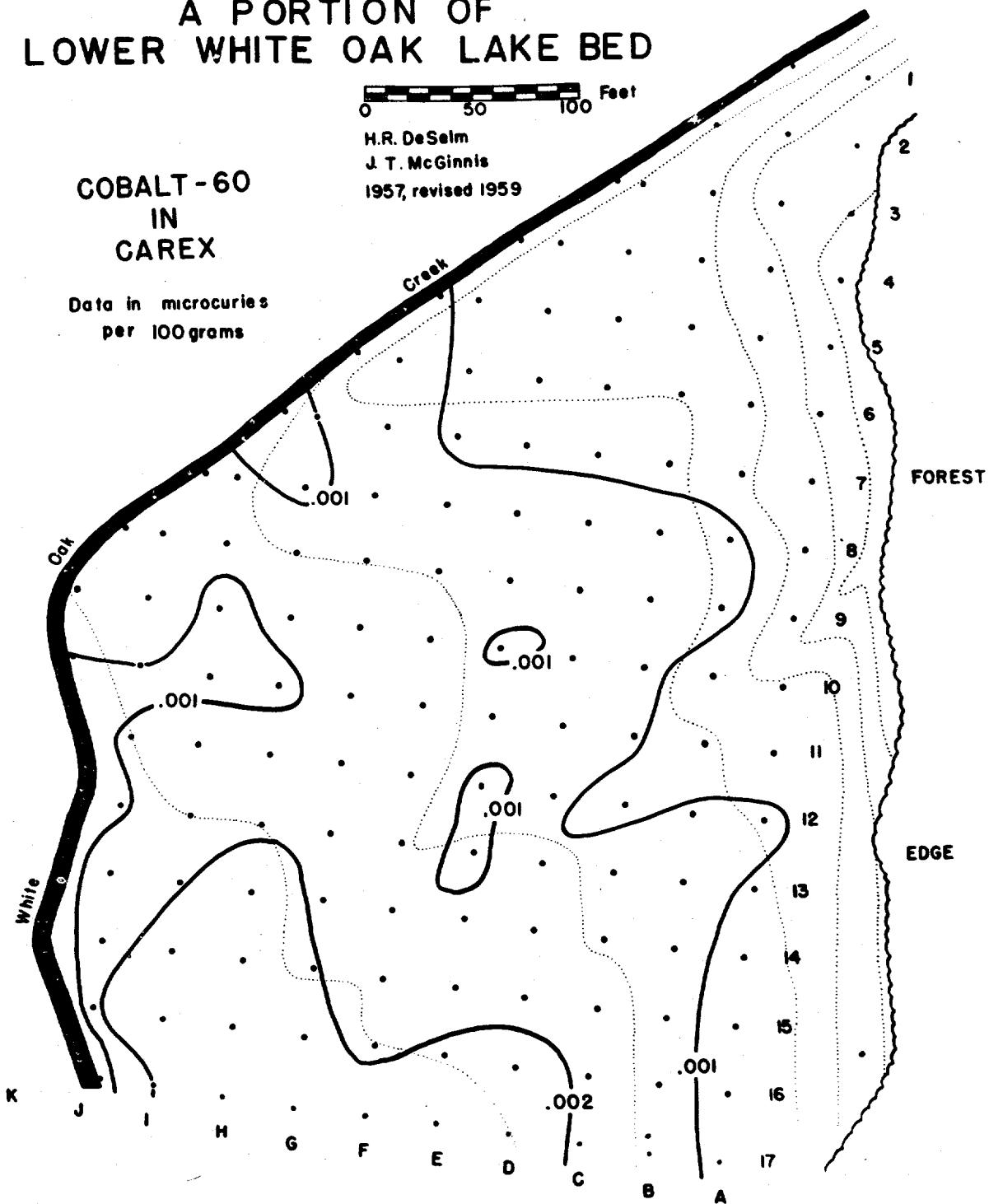


Figure 20. Cobalt-60 in Carex,  $\mu$  c per 100 grams

Stake	Clay		Silt		Sand		Deposit (3)	pH		Exch. Ca(4)
	2(1)	6(2)	2	6	2	6		2	6	
0A	11.3	20.7	79.2	69.2	7.5	10.1	0	7.7	6.4	3046
1A	10.0	16.2	60.0	61.9	30.0	21.9	0	6.8	6.1	1475
1B	10.3	14.1	68.0	61.5	21.7	24.4	0	7.2	7.8	2458
2A	9.4	14.3	59.1	54.3	31.5	32.4	0	6.1	6.4	1274
2B	11.3	23.0	59.2	55.7	29.5	21.3	0	6.5	6.5	
2C	15.7	21.5	73.3	64.1	11.0	14.4	0	7.3	6.4	2274
3A	21.9	27.1	49.1	54.8	29.0	18.1	0	6.0	5.0	1559
3B	11.3	18.0	55.2	64.5	33.5	17.5	0	6.6	5.4	1408
3C	14.5	17.0	73.0	70.9	12.5	12.1	0	6.4	6.0	1385
3D	15.3	17.0	69.0	66.4	16.0	16.6	0	7.8	7.8	4656
4A	18.0	12.3	62.7	69.3	19.3	18.4	0	6.0	5.7	1632
4B	17.4	24.1	69.3	63.5	13.3	12.4	0	6.2	5.6	
4C	15.9	17.0	65.6	66.5	19.5	16.5	0	6.2	5.4	1470
4D	17.6	16.9	69.4	72.1	13.0	11.0	0	7.2	5.6	1567
4E	19.0	20.2	61.1	63.0	19.9	16.8	0	7.0	6.3	2238
5A	20.2	20.3	65.8	67.8	14.0	11.9	0	5.8	5.6	1550
5B	17.0	20.0	67.6	63.5	15.4	16.5	0	6.2	5.5	
5C	14.2	17.0	68.8	67.2	17.0	15.8	0	6.7	5.6	1587
5D	17.4	21.2	66.6	66.2	16.0	12.6	1	7.4	5.8	
5E	18.0	19.5	71.1	68.9	10.9	11.6	2.5	7.8	5.9	2948
5F	14.0	19.4	63.0	60.5	23.0	20.1	0	7.6	6.7	2792
6A	18.5	20.2	59.8	64.9	21.7	14.9	.5	5.8	5.7	1455
6B	17.4	24.3	65.0	62.8	17.6	12.9	.5	6.1	5.6	1133
6C	12.0	18.4	69.0	62.3	19.0	19.3	2.5	7.9	6.5	2698
6D	17.7	18.5	70.6	65.6	11.7	16.1	2.0	8.0	7.0	
6E	15.0	17.4	73.0	68.1	12.0	14.5	3.5	8.1	6.6	3166
6F	13.5	17.3	60.0	57.8	26.5	24.9	3.0	8.0	6.7	3487
6G	16.0	12.6	56.5	70.6	27.5	16.8	0	7.8	7.2	3418
7A	17.5	19.8	64.7	62.8	17.8	16.4	.5	6.0	5.8	1775
7B	16.2	19.5	63.9	60.2	20.2	20.3	1.0	6.0	6.2	1674
7C	13.3	17.9	69.2	60.2	17.5	21.9	2.5	8.0	7.2	3166
7D	19.0	18.1	74.0	65.9	7.0	16.0	4.5	8.1	7.8	4108
7E	20.4	17.8	69.4	68.2	10.2	14.0	3.0	8.0	7.5	2318
7F	18.4	19.6	61.6	60.1	20.0	20.3	4.0	7.9	7.8	3998
7G	16.0	15.9	60.5	55.4	23.5	28.7	3.0	7.9	7.2	3222
7H	18.5	16.9	54.5	51.9	27.0	31.2	0	8.0	7.4	3567

Table 1. Chemical and physical data from the lake bed soil, 1958.

(1) depth 0-2 inches, data in percent.

(2) depth 2-6 inches, data in percent.

(3) depth of surface lacustrine silt loam deposit in inches.

(4) in p.p.m., 0-6 inches depth.

Stake	Exchange K(1)	0-6 in. Mg(1)	Total Cs-137(2)		Exchange 2	Cs-137(2, 6	Total Co-60(2)	
			2	6			2	6
0A	73	169	1.69	.23	.04	.008	.62	.14
1A	45	136	.88	.19	.026	.007	.04	.14
1B	54	160	1.13	.55	.023	.007	.44	.34
2A	55	162	.08	.03	.013	.004	.15	.03
2B			.39	.04	.010		.28	.03
2C	63	159	1.25	1.12	.026	.003	.34	.12
3A	64	223	.095	.08	.007	.012	.07	.02
3B	41	129	.19	.05	.008	.006	.12	.003
3C	28	105	.20	.02	.004	.002	.11	.04
3D	67	185	3.48	1.71	.013	.023	.31	.08
4A	56	154	.08	.002	.002	.001	.06	.003
4B			.28	.02	.001	.010	.30	.011
4C	51	136	.48	.07	.009	.0009	.26	.025
4D	67	123	1.28	.04	.016	.0023	.27	.037
4E	78	201	3.34	.05	.012	.0019	.27	.041
5A	46	149	.05	.01	.002	.003	.03	.012
5B			.18	.01		.0027	.09	.004
5C	57	125	.26	.01	.011	.0004	.16	.009
5D			1.67	.08		.0012	.05	.012
5E	62	159	2.18	.069	.059	.003	.65	.034
5F	67	204	5.33	.10	.021	.005	.51	.011
6A	42	134	.20	.02	.006	.001	.16	.008
6B	43	125	.16	.002	.003	.002	.06	.006
6C	63	138	1.07	.37	.032	.006	.12	.10
6D			1.33	.29		.003	.50	.10
6E	52	173	2.06	.13	.060	.004	.41	.03
6F	62	191	2.43	.08	.060	.004	.53	.05
6G	84	188	3.86	.19	.170	.003	.55	.08
7A	46	189	.13	.010	.050	.003	.083	.004
7B	39	123	.24	.020	.090	.009	.101	.015
7C	47	141	.96	.140	.410	.040	.448	.051
7D	76	230	2.37	1.010	1.46	.087	.625	.036
7E	70	176	3.03	.60	1.41	1.69	.450	.016
7F	46	200	2.48	.47	1.14	.098	.521	.127
7G	130	154	2.04	.036	.71	.050	.425	.022
7H	79	193	3.98	.110	1.40	1.25	.722	.098

Table 2. Concentrations of elements and radionuclides of the lake bed soil, 1958.

(1) in p.p.m., 0-6 inches depth.

(2) in  $\mu\text{c}/100\text{g}$

Stake	Ca(1)	K(1)	Mg(1)	Cs-137(2)	Co-60(2)
0A	3515	24052	2220	.012	.0027
1B	3623	21480	2339	.015	.0004
2A					
2B	3579	22668	1790	.006	.0033
2C	3221	24034	2478	.014	.0011
3A					
3B	3882	23293	2677	.009	.0015
3C	3985	26211	2299	.013	.0025
3D	3521	21767	2081	.009	.0004
4A					
4B					
4C	3370	22542	1743	.017	.0004
4D	2632	25346	2047	.022	.0004
4E	3450	28348	2238	.009	.0003
5A					
5B	3158	25576	1737	.005	.0014
5C	3475	24131	2124	.019	.0025
5D	4077	26936	2038	.032	.0014
5E	4531	32871	3198	.016	.0007
5F	3752	24014	2573	.024	.0009
6A	3712	22449	2161	.008	.0008
6B	3544	22785	1899	.005	.0003
6C	3177	22646	2043	.008	.0009
6D	2922	29220	2023	.013	.0009
6E	4226	31270	2218	.023	.0005
6F	3456	28395	2242	.007	.0008
6G	4150	28822	2652	.016	.0016
7A					
7B					
7C					
7D					
7E	3432	23535	2206	.013	.0006
7F	3716	25000	2196	.022	.0004
7G	3741	25566	2494	.016	.0012
7H					

Table 3. Concentrations of elements and radionuclides in  
in lake bed Carex, 1958.

(1) in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$

Stake	Clay(1)		Silt(1)		Sand(1)		Depth Deposit(2)	pH		Exch. Ca(3)
	2	6	2	6	2	6		2	6	
8A	17.4	17.4	62.8	56.0	20.0	26.6	0	6.3	6.2	
8B	19.7	17.4	66.3	66.5	14.0	16.1	2.0	6.3	5.9	1529
8C	17.0	15.3	75.0	66.0	8.0	18.7	4.0	8.0	6.8	3099
8D	22.0	18.3	67.2	66.6	4.0	16.1	4.0	8.0	7.4	3840
8E	24.2	21.6	70.8	66.7	5.0	11.7	6.0	8.1	7.8	5397
8F	21.7	15.3	72.3	55.5	6.0	28.8	4.0	8.1	6.6	3720
8G	16.4	15.0	69.3	50.6	14.3	34.6	2.5	8.2	7.5	3683
8H	15.1	14.6	57.4	62.1	27.5	47.5	2.5	7.8	7.4	3644
8I	17.3	18.2	45.7	59.5	37.0	32.3	0	7.6	7.9	
9A	15.3	16.6	47.7	49.6	35.0	33.8	0	6.6	5.9	
9B	18.9	18.3	66.1	65.2	15.0	16.5	0	6.9	6.4	2015
9C	19.0	19.1	70.8	64.2	10.0	16.7	2.0	7.7	6.8	2945
9D	21.7	16.8	65.8	65.3	12.5	14.9	5.5	7.8	5.0	
9E	21.8	17.4	69.5	63.1	8.7	18.5	5.0	8.1	7.5	
9F	25.1	20.3	69.6	66.2	5.3	13.5	6.0	7.9	7.7	5140
8G	23.0	14.6	68.2	54.9	8.8	30.5	4.0	8.0	7.6	
8H	23.7	14.2	61.8	53.6	14.5	32.2	4.0	8.0	7.8	
9I	23.2	19.2	64.8	53.3	12.0	27.5	3.0	8.1	7.9	2970
9J	17.5	14.1	50.1	39.8	32.4	47.1	0	7.8	7.6	
10A	15.3	12.9	58.2	53.0	26.5	34.1	0	6.1	6.2	1875
10B	16.5	18.2	59.5	61.7	24.0	20.1	0	6.8	6.1	
10C	18.2	22.7	64.3	62.9	17.5	14.4	3.0	7.1	6.2	2290
10D	20.6	21.5	72.4	67.5	7.0	11.0	2.5	8.0	6.9	2200
10E	22.3	25.9	71.2	69.2	6.5	5.0	7.0	8.0	7.9	5193
10F	26.2	17.6	70.8	63.5	3.0	18.9	4.5	8.2	7.7	4440
10G	24.3	18.2	71.2	63.5	4.5	18.3	4.5	7.9	8.0	5200
10H	26.5	15.1	68.5	56.8	5.0	29.1	5.0	8.3	7.6	4246
10I	23.4	11.8	62.3	41.0	14.3	47.7	4.0	8.0	7.7	3977
10J	16.3	12.7	53.2	40.3	30.5	47.0	1.5	7.3	7.0	2249
10CK(4)	18.5	16.3	53.0	52.9	28.5	30.8	0	7.4	6.9	2763
11A	21.0	18.6	61.5	64.2	17.5	17.2	2.0	7.0	6.3	1643
11B	14.4	17.6	56.6	58.8	29.0	23.6	0	6.3	5.6	1591
11C	17.1	18.6	57.6	58.7	25.3	22.7	0	6.9	6.4	2160
11D	14.8	20.9	64.2	67.4	21.0	15.4	2.0	7.7	6.5	2807
11E	20.8	22.7	67.2	66.9	12.0	10.4	3.0	8.2	6.8	3580
11F	28.2	24.0	67.4	69.3	4.4	6.7	6.0	8.0	7.8	
11G	32.0	16.8	67.5	59.7	0.5	23.5	7.0	8.0	7.6	5455
11H	27.5	15.8	58.0	47.8	14.5	34.4	3.5	7.9	7.4	
11I	27.1	16.4	59.4	59.0	13.5	24.6	1.0	8.0	7.9	4162
11J	26.3	14.6	55.7	42.1	18.0	34.3	1.0	7.9	8.0	4688
11CK	20.4	16.1	57.4	46.0	22.2	37.9	0	7.7	7.0	2741
11L										2219
11M										3438
11N										2141

Table 4. Chemical and physical data from the lake bed soil, 1958.

(1) in percent dry weight.

(2) in inches.

(3) 0-6 inches in p.p.m.

(4) CK refers to a sampling position along the designated row but adjacent to the creek.

Stake	Exchange		Total	Cs-137(2)		Exchange		Cs-137(2)		Total		Co-60(2)	
	K(1)	Mg(1)		2	6	2	6	2	6	2	6	2	6
8A			.32	.07					.218	.068			
8B	54	119	.50	.10		.013	.005		.272	.085			
8C	56	146	.77	.55		.087	.026		.498	.062			
8D	71	154	2.66	.43		.192	.012		.364	.075			
8E	80	258	2.59	.30		.119	.040		.306	.051			
8F	60	194	2.18	.07		.091	.005		.473	.022			
8G	132	230	2.02	.11		.064	.005		.425	.021			
8H	63	194	3.27	.21		.076	.008		.641	.056			
8I			5.52	1.43		.040			.270	.093			
9A			.38	.06		.013			.451	.069			
9B	53	151	1.68	.59		.048	.010		.551	.091			
9C	68	153	1.51	.17		.037	.007		.647	.087			
9D			1.76	1.52				.014		.604	.139		
9E			3.74	.50		.068	.015		.586	.096			
9F	91	251	4.91	.78		.160	.041		.765	.065			
9G			2.69	.09		.113			.367	.015			
9H			3.55	.21				.008		.556	.030		
9I	71	217	5.00	1.25		.070	.036		.039	.031			
9J			.48	.02		.013	.006		.082	.003			
10A	60	176	.37	.02		.013	.001		.250	.004			
10B			.76	.09			.046		.633	.099			
10C	52	160				.017	.0002			.012			
10D	102	209	1.51	.27		.008	.004		.467	.092			
10E	78	251	3.27	1.96		.102	.067		.655	.087			
10F	84	214	3.00	.17		.109	.010		.446	.051			
10G	79	237	3.35	.51		.123	.056		.496	.038			
10H	69	241	3.81	.14		.113	.007		.443	.016			
10I	71	250	4.84	.23		.207	.009		.343	.015			
10J	51	214	1.29	.03		.051	.001		.086	.003			
LOCK	69	207	3.82	.05		.141	.004		.238	.004			
11A	88	198	.59	.06		.013	.003		.485	.018			
11B	85	170	.75	.05		.019	.003		.482	.019			
11C	111	216	1.01	.07		.011	.003		.311	.015			
11D	47	152	1.84	.40		.045	.006		.603	.088			
11E	63	188	1.82	.08		.071	.004		.423	.046			
11F			4.68	1.11		.179	.061		.618	.045			
11G	90	219	3.54	.17		.157	.019		.444	.026			
11H			3.13	.17			.011		.671	.027			
11I	84	202	3.85	.94		.115	.072		.182	.017			
11J	84	223	5.39	2.90		.256	.129		.218	.020			
11CK	63	223	5.51	.10		.237	.007		.320	.022			
11L(3)60		205		.12			.006			.038			
11M(3)69		258		1.36			.040			.233			
11N(3)104		275		.36			.028			.130			

Table 5. Concentrations of elements and radionuclides of the lake bed soil, 1958.

(1) 0-6 inches in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

(3) K, L, M, N soil samples from 0-6 inches depth.

Stake	Ca(1)	K(1)	Mg(1)	Cs-137(2)	Co-60(2)
8A	3771	31711	2228	.005	.0023
8B					
8C					
8D					
8E					
8F					
8G	3880	24636	2424	.035	.0019
8H	3428	24854	2057	.022	.0003
8I					
9A	3521	24061	2054	.007	.0007
9B	2607	23279	2142	.014	.0010
9C					
9D	2855	21634	1977	.013	.0016
9E					
9F	4198	30336	2573	.052	.0026
9G	3278	24039	2276	.058	.0021
9H	3291	20568	2262	.072	.0020
9I	4077	21549	2621	.062	.0018
9J	4326	20837	2649	.027	.0013
10A					
10B	3299	26210	2016	.004	.0011
10C	2814	30107	1970	.013	.0005
10D					
10E	4123	25843	2568	.019	.0005
10F	3499	27990	2862	.014	.0011
10G	4495	25934	2593	.009	.0016
10H	3309	21969	2514	.048	.0018
10I	4048	21190	2381	.046	.0006
10J	3903	22216	2402	.040	.0014
10CK					
11A					
11B	3324	27168	1879	.005	.0005
11C	3181	25311	2075	.017	.0013
11D					
11E					
11F	4711	26382	2670	.022	.0013
11G	4803	28520	3152	.027	.0013
11H	3378	24155	2365	.045	.0005
11I	4140	22334	2760	.042	.0008
11J	3275	22440	2669	.044	.0010
11CK					
11L					
11M					
11N					

Table 6. Concentrations of elements and radionuclides in lake bed Carex, 1958.

(1) In p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

Stake	Clay(1)		Silt(1)		Sand(1)		Depth Deposit(2)	pH		Exch. Ca(3)
	2	6	2	6	2	6		2	6	
12A	18.3	14.7	59.5	51.7	22.2	33.6	0	6.3	5.6	1857
12B	18.0	14.9	54.5	60.3	27.5	24.8	.5	7.1	6.4	1998
12C	14.3	18.0	58.7	67.2	27.0	14.8	.3	7.0	5.4	1931
12D	16.3	17.4	55.7	61.3	28.1	21.3	0	6.9	6.4	2182
12E	19.5	19.9	68.9	64.0	11.6	16.1	5.5	7.8	6.7	4423
12F	26.8	19.5	69.2	61.9	4.0	16.6	4.0	8.0	7.2	4338
12G	29.3	25.7	67.0	66.0	3.7	8.3	6.0	8.1	8.0	5485
12H	24.5	13.1	54.5	44.6	21.0	42.3	2.0	8.1	7.4	4057
12I	30.1	26.2	66.5	69.3	3.4	4.5	6.5	8.1	8.1	6133
12J	22.7	26.0	60.4	52.4	16.9	21.6	2.0	7.8	7.8	5472
12L										2708
12M										3671
12N										2881
13A	20.8	17.4	71.2	52.6	8.0	30.0	0	6.6	6.3	2113
13B	16.3	20.5	65.5	66.1	18.2	13.4	.5	6.8	7.5	1692
13C	14.9	18.7	65.6	66.6	19.5	14.7	1.5	7.6	7.1	1912
13D	15.3	15.7	64.5	64.8	20.2	19.5	0	6.8	6.2	1519
13E	14.5	18.0	47.0	55.8	38.5	26.2	0	6.8	5.7	1566
13F	24.1	25.7	68.5	68.6	7.4	5.7	6.0	8.0	7.5	5863
13G	30.5	22.0	67.5	65.3	2.0	12.7	6.0	8.0	7.9	5497
13H	28.8	23.2	67.5	67.3	3.7	9.5	7.5	8.1	7.9	5832
13I	27.0	16.0	55.5	35.8	17.5	48.2	2.0	8.1	7.8	4430
13J	15.6	14.7	50.9	40.2	33.5	48.1	0	7.8	7.1	2665
13L										2316
13M										5426
13N										3715
14A	22.2	14.0	51.8	58.3	26.0	27.7	0	6.5	6.2	2144
14B	19.9	19.4	68.2	68.5	11.9	12.1	1.5	7.0	6.4	1894
14C	18.0	20.2	65.5	71.4	16.5	8.4	1.0	7.2	6.1	1838
14D	15.2	19.2	69.0	69.2	15.8	11.6	3.0	7.9	7.3	3663
14E	15.7	14.3	59.3	62.2	25.0	23.5	0	8.1	6.6	3314
14F	19.4	16.5	56.6	57.0	24.0	26.5	0	8.2	7.5	4213
14G	36.8	23.5	60.7	65.3	2.5	11.2	4.0	8.2	7.7	5691
14H	33.5	29.0	65.4	68.9	1.1	2.9	5.0	7.9	8.2	6558
14I	29.2	16.7	66.8	61.2	4.0	16.1	2.0	8.1	7.3	3477
14J	17.7	15.2	55.9	46.3	26.4	39.5	1.5	7.9	6.8	3037
14CK	18.3	17.5	59.2	55.5	22.5	27.0		7.8	6.6	2419

Table 7. Chemical and physical data from the lake bed soil, 1958.

(1) in percent dry weight.

(2) in inches

(3) 0-6 inches in p.p.m.

Stake	Exchange K(1)	Exchange Mg(1)	Total Cs-137(2)		Exchange 2	Cs-137(2) 6	Total Co-60(2)	
			2	6			2	6
12A	90	225	.41	.02	.015	.002	.262	.027
12B	63	187	.83	.08	.016	.007	.470	.092
12C	59	158	.44	.02	.024	.002	.236	.061
12D	81	213	.93	.11	.038	.003	.411	.033
12E	65	204	3.00	.38	.066	.009		.085
12F	71	228	4.39	.52	.133	.011	.614	.022
12G	88	222	4.06	1.02	.227	.051	.470	.068
12H	69	240	2.27	.10	.124	.009	.302	.022
12I	93	292	5.69	2.40	.187	.075	.371	.024
12J	93	282	4.81	.66	.189	.012	.181	.022
12L(3)	59	180		.33		.013		.040
12M(3)	74	231		2.18		.075		.136
12N(3)	58	144		.58		.028		.197
13A	97	280	.70	.10	.022	.005	.559	.093
13B	53	152	.58	.10	.010	.001		.118
13C	51	140	.58	.05	.024	.003	.698	.013
13D	51	146	.24	.02	.013	.001	.143	.012
13E	84	174	1.81	.07	.029	.006	.534	.032
13F	106	223	3.40	2.02	.094	.064	.733	.090
13G	74	218	2.82	.14	.126	.031	.370	.008
13H	87	231	5.19	.87	.181	.051	.276	.004
13I	80	250	5.21	1.75	.309	.082	.246	.015
13J	74	215	2.33	.11	.040	.003	.113	.006
13L(3)	79	266		.50		.026		.032
13M(3)	97	263		3.85		.201		.220
13N(3)	82	225		3.54		.152		.443
14A	102	226	.81	.10	.26	.002		.086
14B	69	159	.44	.06	.010	.003	.205	.015
14C	52	149	.55	.08	.012	.002	.287	.038
14D	73	174	1.75	.36	.054	.011	.606	.105
14E	69	137	2.07	.19	.105	.011	.545	.044
14F	83	205	2.41	.46	.066	.019	.635	.087
14G	91	264	4.39	2.18	.093	.092	.847	.045
14H	119	262	5.36	3.93	.104	.226	.664	.060
14I	68	188	5.20	.90	.196	.003	.251	.006
14J	79	219	4.97	.11	.096	.001	.266	.020
14CK	65	191	4.46	.10	.167	.011	.204	.017

Table 8. Concentrations of elements and radionuclides of the lake bed soil, 1958.

(1) 0-6 inches depth in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

(3) L, M, N soil samples from 0-6 inches depth.

Stake	Ca(1)	K(1)	Mg(1)	Cs-137(2)	Co-60(2)
12A				.002	.0013
12B					
12C				.004	.0007
12D	3772	28454	2802	.010	.0018
12E	3211	26469	2433	.012	.0007
12F	4150	29953	2707	.024	.0031
12G	4114	24687	2469	.023	.0027
12H	3779	22674	2362	.021	.0019
12I	3623	24423	2281	.041	.0017
12J	3108	25580	2749	.051	.0014
12L					
12M					
12N					
13A					
13B					
13C	3418	27935	2526	.013	.0014
13D	4639	28381	2964	.036	.0015
13E	3542	25304	2429	.022	.0005
13F	3883	29048	2588	.014	.0014
13G				.011	.0012
13H	3774	25160	2516	.016	.0013
13I				.034	.0011
13J	4283	27837	2677	.045	.0007
13L					
13M					
13N					
14A	3370	26557	1752	.003	.0023
14B		36032	2834	.010	.0013
14C	3389	26791	2098	.012	.0021
14D					
14E	4362	29342	2577	.019	.0017
14F	4373	28486	2998	.024	.0018
14G	4383	25162	2827	.015	.0013
14H	4611	24111	2372	.048	.0042
14I					
14J					
14K					

Table 9. Concentrations of elements and radionuclides in lake bed Carex, 1958.

(1) in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

Stake	Clay(1)		Silt(1)		Sand(1)		Depth Deposit(2)	pH		Exch. Ca(3)
	2	6	2	6	2	6		2	6	
15A	14.9	18.5	59.1	59.8	26.0	21.7	0	6.3	6.3	1974
15B	19.6	22.4	68.4	64.9	12.0	12.7	.5	7.4	5.7	1838
15C	18.4	22.1	74.6	65.4	17.0	12.5	1.5	7.6	6.0	2138
15D	20.4	19.1	66.3	63.5	13.3	17.3	1.5	8.1	6.8	3889
15E	24.3	22.4	67.9	71.4	7.8	6.2	2.5	8.3	8.0	5558
15F	23.7	16.6	61.6	60.6	14.7	22.8	2.0	8.0	7.2	4763
15G	33.5	24.2	55.7	70.2	10.8	5.6	8.0	8.1	8.3	5749
15H	31.5	24.2	64.0	61.0	4.3	14.8	7.0	8.1	8.2	6030
15I	24.1	17.8	51.6	51.2	24.3	31.0	2.5	8.0	7.5	3707
15J	22.0	15.7	60.5	51.7	17.5	32.6	3.0	8.1	7.2	
15CK	17.0	17.0	56.0	50.6	27.0	32.6	0	8.1	7.8	4378
16A	18.1	20.9	62.9	61.7	19.0	17.4	0	6.5	5.9	1744
16B	20.0	22.1	66.5	65.1	13.5	12.8	1.0	8.0	6.7	3627
16C	20.6	24.2	67.8	61.3	11.5	14.5	3.0	8.2	7.0	3337
16D	23.6	22.3	69.8	64.4	6.6	13.3	2.0	8.2	6.5	4218
16E	29.5	28.6	65.7	68.2	4.8	3.2	4.0	8.0	7.9	6237
16F	25.5	29.1	66.5	67.1	8.0	3.8	3.5	8.2	8.1	5870
16G	37.6	30.3	59.6	67.9	12.8	1.9	8.0	8.3	8.1	5780
16H	36.9	24.7	58.2	53.5	4.9	21.8	2.5	8.2	8.1	6043
16I	32.0	21.2	64.0	59.3	4.0	19.5	5.0	7.9	7.8	5316
16J	17.8	18.4	55.2	53.1	27.0	28.5	0	8.0	6.9	
16CK	17.1	19.2	52.2	50.9	30.7	29.9	0	7.3	6.4	
17A	21.7	12.2	65.4	79.2	12.9	8.6	0	6.9	6.4	2304
17B	21.3	24.8	65.6	63.2	13.1	12.0	2.0	8.0	6.8	
17C	24.2	24.7	61.2	61.8	14.6	13.8	2.0	7.9	6.5	2328
17D	20.0	24.6	72.1	64.5	7.9	10.9	3.0	8.1	7.1	4536
17E	33.9	25.1	61.6	66.4	3.5	8.5	3.5	8.0	7.8	6051
17F	28.7	25.4	58.0	54.6	13.3	20.0	4.0	8.1	7.8	6016
17G	38.2	32.4	59.9	64.7	1.9	2.9	7.0	8.3	8.0	6171
17H	38.1	23.4	57.6	56.1	4.3	20.5	4.0	8.0	8.4	5925
17I	35.8	21.1	61.2	58.8	3.0	20.1	7.0	8.0	8.2	5629
17CK	17.9	17.7	56.1	53.9	25.0	28.4	0	7.6	6.7	2484

Table 10. Chemical and physical data from the lake bed soil, 1958.

(1) in percent dry weight.

(2) in inches.

(3) 0-6 inches in p.p.m.

	Exchange K(1)	Mg(1)	Total	Cs-137(2) 2	Cs-137(2) 6	Total	Co-60(2) 2	Co-60(2) 6
15A	61	232		.03		.019	.004	.037
15B	49	138	.33	.02		.105	.001	.166
15C	84	214	.77	.06		.016	.003	.535
15D	56	172	2.23	.41		.029	.017	.758
15E	98	255	2.55	2.08		.099	.151	.772
15F	62	238	3.09	.87		.075	.053	.599
15G	82	235	3.71	2.81		.133	.129	.610
15H	95	296	5.88	1.88		.204	.118	.373
15I	76	213	2.82	.17		.122	.006	.211
15J			3.77	.09			.005	.182
15CK	79	202	4.95	1.99		.160	.094	.329
16A	62	146	1.16	.03		.018	.002	.494
16B	71	154	1.39	.07		.045	.005	.630
16C	68	147	1.85	.14		.044	.002	.654
16D	78	188	2.52	.28		.058	.010	.720
16E	91	221	3.75	2.99		.085	.108	1.062
16F	83	251	3.60	3.07		.127	.125	.802
16G	103	283	3.30	4.51		.115	.293	.643
16H	106	293	5.31	3.56		.200	.143	.545
16I	88	254	4.79	1.33		.120	.054	.612
16J			.83	.05		.015	.002	.104
16CK								.006
17A	58	190	.43	.01		.009	.006	.315
17B			1.48	.20		.060	.001	.651
17C	64	186	1.52	.05		.016	.007	.553
17D	79	181	2.54	.40		.088	.015	.615
17E	107	232	4.21	1.69		.136	.105	1.043
17F	97	315	3.72	2.05		.168	.058	.900
17G	109	274	3.42	4.03		.151	.273	.692
17H	94	282	4.30	4.60		.080	.184	.440
17I	98	304	5.36	1.74		.153	.079	.220
17CK	59	236	4.08	.04		.170	.004	.078
								.003

Table 11. Concentrations of elements and radionuclides of the lake bed soil, 1958.

(1) 0-6 inches in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

	Ca(1)	K(1)	Mg(1)	Cs-137(2)	Co-60(2)
15A	2595	23933	1442	.006	.0025
15B					
15C	4811	27757	2220	.012	.0012
15D	3696	25281	2661	.017	.0042
15E	4320	32829	2808	.021	.0014
15F	4542	29144	2839	.024	.0013
15G	4533	28710	3022	.013	.0024
15H					
15I	3966	21932	2566	.045	.0017
15J					
15CK					
16A					
16B					
16C	3931	27956	2330	.006	.0020
16D	3849	28386	2406	.011	.0024
16E	4781	28883	2869	.016	.0021
16F	4175	28793	2436	.024	.0017
16G	5057	28229	2823	.022	.0028
16H	4627	30898	2429	.041	.0047
16I		25398	2432	.017	.0021
16J					
16CK					
17A					
17B					
17C					
17D	5167	28332	2495	.019	.0022
17E	5832	29806	3024	.027	.0026
17F	4905	30196	2759	.013	.0022
17G	5426	25694	2873	.062	.0032
17H	3862	27102	2350	.051	.0024
17I	2487	28397	2621	.045	.0020
17CK	3226	22122	2518	.055	.0006

Table 12. Concentrations of elements and radionuclides in lake bed Carex, 1958.

(1) in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

<u>Stake</u>	Ca(1)	K(1)	Mg(1)	Cs-137(2)	Co-60(2)
0A	2306	17293	1153	.003	.0007
4B	2266	18438	618	.003	.0016
6E	2450	17358	1429	.008	.0019
7A	2679	15573	1005	.001	.0004
7B	3887	17711	1512	.003	.0006
7D	2273	18750	1704	.007	.0009
7H	3220	16415	1844	.017	.0006
8B	3168	17744	1479	.006	.0007
8C	3418	20129	1139	.008	.0018
8D	2466	16991	1370	.006	.0012
8E	3708	19365	1442	.029	.0032
8F	2786		1114	.015	.0007
8I	2826	16072	1590	.021	.0022
9C	2464	19326	1297	.005	.0016
9E	2444	16293	1018	.012	.0019
9F	2514	19274	1397	.015	.0020
10A	2318	17386	1159	.002	.0017
10C	2652	18322	1205	.005	.0008
10D	2894	18700	1558	.005	.0009
10CK	2829	16317	1166	.024	.0014
11A	3342	17738	1028	.002	.0006
11D	2560	17661	640	.016	.0012
11F	2898	18769	1380	.006	.0031
11CK	4098	17641	1960	.029	.0068
12B	2382	19058	1191	.005	.0012
12G	3257	18855	1371	.017	.0024
13A	2890	17052	1012	.004	.0015
13B	2334	18662	1297	.004	.0007
13G	2961	19245	1480	.015	.0028
14D	3279	18215	1093	.006	.0019
14I	4038	19105	2019	.036	.0042
14CK	3239	18219	1419	.026	.0022
15B	2398	18074	1107	.004	.0014
15H	4513	22189	1880	.014	.0038
15J	3498	17136	1943	.015	.0023
16B	2259	18891	1027	.002	.0018
16D	3587	19608	1435	.006	.0006
17A	2923	18392	853	.003	.0010
17B	2725	17344	1115	.006	.0023
17C	2254	19033	751	.007	.0037
17D	3589	19291	1570	.012	.0058

Table 13. Concentrations of elements and radionuclides in the lake bed Juncus, 1958.  
 (1) in p.p.m.  
 (2) in  $\mu$ c/100g.

Stake	Ca(1)	K(1)	Mg(1)	Cs-137(2)	Co-60(2)
9J	8498	2833	1204	.003	.0002
10CK	6209	2451	1062	.006	.0005
11L	8300	2126	810	.002	.0003
11M	8847	3125	994	.001	.0003
12L	9350	2559	1181	.001	.0003
12M	7421	2412	1113	.002	.0006
12N	898	3155	971	.002	.0009
13L	5447	2536	1208	.002	.0005
13M	7750	1556	584	.003	.0006
13N	10425	3187	1000	.001	.0006
13CK	8533	2994	1062	.002	.0005
13K	6763			.003	.0050
14CK	7674	3721	1163	.008	.0008
14L	9848	2778	1347	.002	.0004
14L-CK		3156	1010	.005	.0007
15CK	13529	3235	1176	.004	.0004
16K-L	11110	4422	1134	.009	.0017

Table 14. Concentrations of elements and radionuclides of lake bed Salix (whole tops of five foot trees), 1958.

(1) in p.p.m.

(2) in  $\mu\text{c}/100\text{g}$ .

Depth	Pit at 8B			Pit at 10H		
	pH	Total		pH	Total	
		Cs-137	Co-60		Cs-137	Co-60
0-1	6.4	.814	.539	8.0	.930	.354
1-2	7.3	.693	.441	8.0	.450	.203
2-3	5.7	.065	.014	7.8	.047	.078
3-4	5.6	.011	.006	7.4	.007	.017
4-5	5.6	.012	.003	7.2	.010	.003
5-6	5.5	.021	.015	7.2	.017	.004
6-7				6.6		
Pit at 12D				Pit at 17I		
0-1	6.6	.930	.354	8.0	3.08	1.093
1-2	6.4	.450	.203	8.1	4.40	.648
2-3	6.0	.074	.078	7.9	5.82	.019
3-4	5.7	.007	.017	8.1	1.78	.015
4-5	5.6	.010	.003	7.6	.051	.003
5-6	5.5	.017	.004	7.0	.029	.006
6-7				7.1	.026	.003
7-8				7.1	.005	.003
8-9				7.0	.010	.004

Table 14A. pH, total Cs-137 and Co-60 in soil at one inch interval depth from four pits dug on the lake bed, June, 1958.

Stake	Exch. Na(1)	Exch. Sr(1)	Exch. Sr-90(2)	Carex Sr(3)	Carex Sr-90(4)
4E	21.3	8.3	.023	7.6	.016
5E	17.6	8.4	.017	6.0	.019
5F	21.5	10.0	.035	16.3	.018
6E	20.2	8.8	.042	6.3	.023
6F	16.3	8.6	.043	5.2	.014
6G	16.5	9.6	.035	7.4	.016
7G	16.4	9.5	.034	6.2	.014
8G	17.3	10.4	.052	7.7	.016
9F	22.3	10.7	.049	13.0	.020
10E	25.1	12.3	.040	14.2	.019
10F	37.1	9.7	.029	13.2	.010
10G	21.5	12.0	.043	16.6	.022
11G	34.3	11.7	.039	14.4	.030
12D	20.1	7.6	.033	10.8	.021
12E	23.3	11.1	.037	12.1	.021
12F	27.4	12.6	.039	10.1	.036
12G	22.2	11.4	.035	17.1	.022
13D	19.1	5.2	.022	13.4	.013
13E	23.8	5.3	.033	9.3	.017
13F	21.2	12.7	.044	10.4	.017
14E	19.4	9.1	.045	8.7	.027
14F	24.5	13.2	.043	5.5	.025
14G	21.7	15.3	.039	7.9	.017
15D	17.6	8.2	.040	10.1	.033
15E	22.6	9.5	.062	14.7	.028
15F	23.3	12.7	.045	18.9	.031
15G	26.4	14.6	.034	10.1	.061
16D	19.4	10.9	.042	10.0	.023
16E	23.3	13.6	.054	17.4	.030
16F	23.4	13.8	.064	18.1	.027
16G	25.4	14.9	.033	13.2	.022
17D	20.4	11.6	.044	8.6	.022
17E	25.5	14.0	.047	4.7	.040
17F	24.6	13.8	.063	15.9	.029
17G	26.3	16.2	.040	15.3	.015

Table 15. Concentrations of sodium, strontium and strontium -90 in the lake bed soil and Carex, 1958.

- (1) 0-6 inches depth in p.p.m.
- (2) 0-6 inches depth in  $\mu\text{c}/100\text{g}$ .
- (3) in p.p.m.
- (4) in  $\mu\text{c}/100\text{g}$ .

Stake	Ca <sup>a</sup>	K <sup>a</sup>	Mg <sup>a</sup>	Sr-90 <sup>b</sup>	Cs-137 <sup>b</sup>
4E	3882	144	277	.038	.094
5E	4840	122	235	.057	.075
5F	4383	133	276	.049	.148
6E	4575	108	237	.051	.055
6F	4414	181	300	.046	.072
6G	5306	195	314	.058	.134
7E	5400	157	251	.060	.096
7F	5281	148	266	.043	.052
7G	5034	153	276	.013	.075
8E	5730	144	263	.047	.094
8F	5533	105	251	.053	.088
8G	5349	174	246	.054	.036
9E	5506	108	278	.046	.105
9F	5303	108	288	.050	.094
9G	5186	125	327	.051	.093
10E	5975	92	257	.049	.155
10F	5303	113	257	.037	.066
10G	5894	123	286	.042	.118
11E	4369	123	246	.033	.048
11F	5991	112	287	.051	.122
11G	6285	134	298	.036	.143
12E	5101	133	215	.043	.039
12F	6180	113	324	.062	.105
12G	5929	113	298	.042	.124
13E	2719	180	288	.045	.053
13F	6108	123	288	.056	.094
13G	6305	116	305	.039	.110
14E	2897	108	236	.036	.064
14F	5721	113	256	.047	.077
14G	6128	144	309	.035	.133
15E	5772	115	282	.058	.067
15F	5585	115	261	.046	.059
15G	6803	113	273	.040	.110
16E	6591	111	280	.067	.112
16F	6689	114	284	.068	.104
16G	7063	114	315	.038	.102
17E	7247	138	281	.061	.099
17F	6098	113	272	.056	.092
17G	7329	126	321	.046	.115

Table 15A. Content of the surface six inches of lake bed soil, autumn, 1960. (a) P.p.m., (b)  $\mu\text{c}/100\text{g}$  in exchange as measured by  $\text{NH}_4\text{OAc}$  leaching. Analyses by J. Wolfe at U.T., except Sr-90 which was done at ORNL.

	Code
<i>Carex frankii</i>	1
<i>Juncus tenuis</i>	2
<i>J. effusus</i> var. <i>solutus</i>	3
<i>Scirpus rubricosus</i>	4
<i>Echinochloa crusgalli</i> var. <i>frumentacea</i>	5
<i>E. crusgalli</i> typical	6
<i>Eulalia viminea</i>	7
<i>Muhlenbergia frondosa</i>	8
<i>Leersia virginica</i>	9
<i>Panicum stipitatum</i>	10
<i>Arthraxon hispidus</i> var. <i>cryptantherus</i>	11
<i>Polygonum lapathifolium</i>	12
<i>Bidens frondosa</i>	13
<i>Impatiens capensis</i>	14
<i>Lespedeza cuneata</i>	15
<i>Boehmeria cylindrica</i>	16
<i>Mimulus alatus</i>	17
<i>Vernonia altissima</i>	18
<i>Lycopus americanus</i>	19
<i>Oenothera biennis</i>	20
<i>Eupatorium serotinum</i>	21
<i>E. purpureum</i>	22
<i>E. coelestinum</i>	23
<i>Solidago altissima</i>	24
<i>Ambrosia artemisiifolia</i>	25
<i>Helenium autumnale</i>	26
<i>Polygonum pensylvanicum</i>	27
<i>Phytolacca americana</i>	28
<i>Actinomeris altissima</i>	29
<i>Solidago gigantea</i>	30
<i>Amorpha canescens</i> tops	31 tops
<i>Platanus occidentalis</i> leaf	32 leaf
branch	branch
<i>Ulmus americana</i> tops	33 tops
<i>Hypericum densiflorum</i> tops	34 tops
<i>Acer negundo</i> leaf	35 leaf
branch	branch
<i>Bignonia capreolata</i>	36
<i>Rhus glabra</i> leaf	37 leaf
branch	branch
<i>Fraxinus pennsylvanica</i> leaf	38 leaf
branch	branch
<i>Salix nigra</i> wood & bark	39 wood & bark
whole tree	whole tree
bark	bark
wood	wood
leaf	leaf

Table 16. Plant taxa and parts used in chemical analyses of White Oak Lake bed plants. Code refers to designation of taxon or part used in tables which follow.

Code	1956	1957	1958	1959	1960
1		42.1	49.2	44.0	(7)
2	48.1				
3	45.5	45.8	53.2	48.3	42.2
4			50.1	44.4	
5					
6	53.6		48.5		
7			46.9	46.0	40.9
8			47.9		
9			49.0		
10			47.6		
11				43.9	
12	46.1	46.0	48.2	45.9	
13	45.5	45.4	48.1		
14		41.4	44.2	(6)	41.5
15		46.5	49.6	49.1	43.1
16			50.6	(5)	43.8
17			52.3		
18			50.1	45.6	(7)
19			48.6		
20			48.4	45.6	45.1
21			51.1	46.3	
22			51.2	46.7	44.1
23				44.0	40.9
24			51.6		
25			49.6	(5)	
26			46.2		
27			49.0	47.1	
28				40.1	37.9
29				44.0	
30					
31	tops			46.7	
32	leaf			49.3	
	branch			45.8	
33	tops			44.9	
34	tops			47.8	
35	leaf			45.9	
	branch			47.5	
36				48.2	
37	leaf			46.3	
	branch			46.3	
38	leaf			48.7	
	branch			45.7	
39	wood and bark			52.1	
	whole tree			49.4	(5)
	bark	(1)		49.7	45.0
	wood	(2)		(3)	(4)
	leaf			51.7	(5)
					(7)

Table 17. Percent carbon in lake bed plants.

(1) 46.0, 45.6; (2) 47.0, 45.7; (3) 49.5, 52.0; (4) 48.0, 46.6, 46.5; (5) see table 29; (6) see tables 31, 32; (7) see table 33. 1956 analyses at Knoxville Chemical-Medical Laboratory, others ORNL.

Code	1956 <sup>a</sup>	1957 <sup>a</sup>	1958 <sup>b</sup>	1959 <sup>c</sup>
1		.54	.81	.81
2	1.50			
3	.58	1.70	1.41	1.31
4			.60	.98
5	1.50			
6	1.30		.77	
7			.73	
8			.73	
9			.88	
10			.86	
11				
12	.87	.80	.54	
13	.82	.55	1.36	
14		.46	1.90	
15		.80	1.23	.76
16			1.12	(4)
17			.65	
18			.89	
19			.96	
20			.71	2.90
21			.78	.90
22			.75	1.47
23				.73
24			.80	
25			1.03	.92
26			.67	
27			.73	.94
28				.97
29				1.71
30				
31			1.03	
32 leaf				1.31
branch				
33 tops				1.05
34 tops				1.10
35 leaf				1.00
branch				
36				.90
37 leaf				.91
branch				
38 leaf				.86
branch				
39 wood & bark		1.10		
whole tree				
bark			(1)	.47
wood			(2)	.92
leaf				(3)
				2.27
				(4)

Table 18. Percent nitrogen of lake bed plants. (a) work at ORNL (Laing); (b) work by J. McCarthy at U.T. AEC Laboratory; (c) work by J. Wolfe at U.T. (1) 1.93, 1.59; (2) .61, .49; (3) .14, .22; (4) see table 29.

Code	1956 <sup>a</sup>	1957 <sup>a</sup>	1958 <sup>b</sup>	1959 <sup>b</sup>	1960 <sup>b</sup>
1		1680	(6)	4762	(10)
2	1800				
3	2455	1800	(7)	4040	3297
4			2700	2206	
5	4682				
6	3785		2650		
7			4960	4063	5956
8			3410		
9			2040		
10			3100		
11				6166	
12	7092	9000	13070	11081	
13	4236	3660	11770		
14		7980	25380	(9)	17995
15		12300	8750	7770	11565
16			19550	(5)	25316
17			4160		
18			9890	14490	(10)
19			9320		
20			7000	9260	12133
21			5900	5353	
22			9000	6740	10816
23				20454	27850
24			5450		
25			8640	(5)	
26			10270		
27			7040		
28				4605	
29				15652	19171
30				5921	
31			9660	8270	
32	leaf			8206	
	branch			8457	
33	tops			11058	
34	tops			4740	
35	leaf			17052	
	branch			3299	
36				8403	
37	leaf			9091	
	branch			7914	
38	leaf			8621	
	branch			4489	
39	wood & bark				
	whole tree		(8)	5962	(11)
	bark		(1)	21200	19156
	wood		(2)	(3)	(4)
	leaf			10000	(5)
					(10)

Table 19. P.p.m. calcium of lake bed plants (a) work at ORNL (Laing); (b) work by J. Wolfe at U.T. (1) 9600, 3060; (2) 480, 1020; (3) 1100, 2400; (4) 978, 1023; (5) see table 30; (6) see table 3, 6, 9, 12; (7) see table 13; (8) see table 14; (9) see tables 31, 32; (10) see table 33; (11) see table 35.

Code	1956 <sup>a</sup>	1957 <sup>a</sup>	1958 <sup>b</sup>	1959 <sup>b</sup>	1960 <sup>b</sup>
1		32220	(5)	17733	(9)
2	21000				
3	24000	9180	(6)	12879	12288
4			8860	9854	
5	15109				
6	12431		16500		
7			8820	10948	12707
8			7350		
9			5710		
10			11050		
11				13940	
12	3951	2760	21267	19459	
13	3168	2100	24920		
14		25800	33850	(8)	26797
15		4080	6650	6884	5982
16			17740	(4)	17603
17			10970		
18			16410	17450	(9)
19			22480		
20			16000	9722	16111
21			12700	14580	
22			14000	12386	12747
23				19320	17704
24			10000		
25			16120	(4)	
26			11600		
27			16300		
28			33990	40602	
29			12590	14300	23964
30				13160	
31			800	7960	
32	leaf			7975	
	branch			5053	
33	tops			1923	
34	tops			4813	
35	leaf			11850	
	branch			7292	
36				11344	
37	leaf			15550	
	branch			8990	
38	leaf			5172	
	branch			3522	
39	wood & bark	2820		(7)	(10)
	whole tree				
	bark		4380	4400	6494
	wood		(1)	(2)	(3)
	leaf			11710	(4)
					(9)

Table 20. P.p.m. potassium of lake bed plants. (a) work at ORNL (Laing); (b) work by J. Wolfe at U.T. (1) 960, 1380; (2) 1300, 1600; (3) 1151, 1222, 1802; (4) see table 30; (5) see table 3, 6, 9, 12; (6) see table 13; (7) see table 14; (8) see tables 31, 32; (9) see table 34; (10) see table 35.

Code	1958	1959	1960
1	(5)	1455	(9)
2			
3	(6)	1768	1448
4	650	1460	
5			
6	2770		
7	1180	1016	1588
8	1060		
9	820		
10	1910		
11		1608	
12	3320	2568	
13	3930		
14	4230	(8)	2934
15	1100	1173	1894
16	4470	(4)	5044
17	1700		
18	3300	5204	(9)
19	2560		
20	1550	2093	2387
21	1700	1822	
22	5000	7741	6374
23		5303	6763
24	1650		
25	2420	(4)	
26	2120		
27	3890		
28		4511	
29		8696	6990
30		1710	
31	1920	1455	
32 leaf		2301	
branch		931	
33 tops		962	
34 tops		1940	
35 leaf		5780	
branch		1736	
36		2101	
37 leaf		1196	
branch		1079	
38 leaf		4468	
branch		1519	
39 wood & bark			
whole tree	(7)	1278	(1)
bark	1350	649	
wood	(2)	(3)	
leaf	1290	(4)	(9)

Table 21. P.p.m. magnesium in lake bed plants. Analyses by J. Wolfe at U.T. (1) see table 35; (2) 350, 350; (3) 244, 116, 256; (4) see table 30; (5) see tables 3, 6, 9, 12; (6) see table 13; (7) see table 14; (8) see table 31, 32; (9) see table 33.

Code	1956	1957	1958	1959	1960
1		540	1500	1067	(7)
2	5800				
3	530	540	4400	1515	949
4		700	2190		
5	3490				
6	2820	2750			
7			1700	2032	1588
8			1700		
9			850		
10			1750		
11				1878	
12	547	660	2300	2838	
13	758	360	3900		
14		5400	3200	(6)	6161
15			1600	815	1097
16			4400	(5)	4846
17			2200		
18			1950	2755	(7)
19			2500		
20			2700	2315	3133
21			2900	3645	
22			2150	1821	1835
23				3788	2909
24			1900		
25			3250	(5)	
26			1600		
27			1750		
28				4135	
29				4956	4443
30				3553	
31			1900	1072	
32	leaf branch			1840	
33	tops			1862	
34	tops			1443	
35	leaf branch			1437	
36				2890	
37	leaf branch			1910	
38	leaf branch			1681	
39	wood & bark whole tree		1500	(5)	(1)
	bark	(2)	2500	1350	
	wood		(3)	(4)	
	leaf		2550	(5)	(7)

Table 22. P.p.m. phosphorus of lake bed plants. (1) See table 35;  
 (2) 420, 1080; (3) 700, 1100; (4) 523, 489, 384. Work by J. Wolfe at  
 U.T. (5) see table 30; (6) see tables 31, 32; (7) see table 34.

Code	1959	1958
	Sodium	Strontium
1	106	(2)
2		
3	207	8.8
4	73	6.0
5		
6		11.8
7	45	15.1
8		3.5
9		7.9
10		16.8
11	67	
12	54	30.2
13		21.8
14	(5)	33.3
15	36	17.0
16	(4)	27.9
17		10.4
18	71	18.4
19		26.7
20	46	24.8
21	57	20.0
22	36	22.0
23	189	
24		16.4
25	(4)	20.6
26		17.2
27		23.3
28	122	
29	70	
30	132	
31	61	25.0
32 leaf	61	
branch	53	
33 tops	48	
34 tops	86	
35 leaf	144	
branch	226	
36	105	
37 leaf	96	
branch	54	
38 leaf	129	
branch	124	
39 wood & bark		
whole tree	77	13.0
bark	130	28.0
wood	(1)	(3)
leaf	(4)	27.4

Table 23. P.p.m. sodium in 1959 and strontium in 1958 in lake bed plants. (1) 45, 49, 58. (2) see table 15; (3) 6.6, 4.4; (4) see table 29; (5) see tables 31, 32. Analyses by J. Wolfe at U.T.

Code	1956	1957	1958	1959	1960
1		.040	(1)	.046	(8)
2	.023				
3	.058	.006	.022	.023	.017
4			.013	.009	
5	.043				
6	.054		.018	.063	
7			.040		.041
8			.013		
9			.014		
10			.029		
11			.071		
12	.073	.022	.181	.264	
13	.021	.029	.085		
14			.224	.179	.148
15		.037	.072	(7)	.066
16			.157	(6)	.111
17			.029		
18			.019	.044	.035
19			.058		
20			.142	.064	.082
21			.042	.031	
22			.046	.028	.047
23				.131	.149
24			.030		
25			.128	(6)	
26			.033		
27			.069		
28				.045	
29				.150	.171
30				.035	
31			.074	.043	
32	leaf			.023	
	branch			.016	
33	tops			.067	
34	tops			.039	
35	leaf			.101	
	branch			.033	
36				.076	
37	leaf			.147	
	branch			.156	
38	leaf			.019	
	branch			.015	
39	wood & bark				
	whole tree			.011	.021
	bark		(2)	.035	.040
	wood		(3)	(4)	(5)
	leaf			.024	(6)
					(8)

Table 24. Strontium-90 in lake bed plants. Analyses by ORNL personnel in  $\mu\text{c}/100\text{g}$ . (1) See table 15; (2) .006, .005; (3) .001, .002; (4) .004, .006; (5) .003, .003, .004. (6) See table 30; (7) see tables 31, 32; (8) see table 34.

Code	Rare	earths	Cerium-144	
	1956	1957	1957	1958
1		.040	.0003	
2				
3		.015	.0005	.0009
4				.0006
5		.012		
6		.037		.0006
7				.0001
8				.0007
9				.0007
10				.0003
11				
12		.037	.0003	.0006
13		.017	.0005	.0005
14			.0020	.0004
15			.0008	.0010
16				.0005
17				.0004
18				.0009
19				.0006
20				.0005
21				.0001
22				.0001
23				
24				.0003
25				.0005
26				.0007
27				.0005
28				
29				
30				
31				.0005
32	leaf			
	branch			
33	tops			
34	tops			
35	leaf			
	branch			
36				
37	leaf			
	branch			
38	leaf			
	branch			
39	wood & bark			
	whole tree			
	bark	(1)	(3)	.0006
	wood	(2)	(4)	.0003
	leaf			.0002

Table 25. Trivalent rare earths (1956, 1957), and cerium-144 (1957, 1958) in lake bed plants. (1) .006, .004; (2) .0014, .0021; (3) .0007, .0003; (4) .0001, .0002. Analyses by ORNL personnel in  $\mu\text{c}/100\text{g}$ .

Code	1956 <sup>a</sup>	1957 <sup>a</sup>	1958 <sup>b</sup>	1959 <sup>c</sup>	1960 <sup>d</sup>
1		.021	(1)	.015	(2)
2	.007				
3	.013	.005	(3)	.015	.006
4			.013	.001	
5	.038				
6	.019		.051		
7			.006	.006	.008
8			.089		
9			.016		
10			.098		
11				.041	
12	.004	.021	.111	.008	
13	.005	.006	.050		
14		.229	.027	(10)	.006
15		.002	.002	.001	.003
16			.020	(8)	.018
17			.037		
18			.026	.005	(2)
19			.029		
20		.003		.006	.007
21			.009	.006	
22			.044	.006	.010
23				.035	.024
24			.033		
25			.128	(8)	
26			.010		
27			.008		
28				.006	
29				.047	.021
30				.010	
31			.007	.001	
32	leaf			.004	
	branch			.002	
33	tops			.004	
34	tops			.007	
35	leaf			.058	
	branch			.009	
36				.003	
37	leaf			.003	
	branch			.002	
38	leaf			.015	
	branch			.048	
39	wood & bark				
	whole tree		(9)	.001	.002
	bark	(4)	.006	.016	
	wood	(5)	(6)	(7)	
	leaf		.003	(8)	(2)

Table 26. Cesium-137 in lake bed plants. (1) See tables 3, 6, 9, 12;  
(2) see table 34; (3) see table 13; (4) .002, .004; (5) .0004, .0004;  
(6) .0008, .0010; (7) .0001, .0005; (8) see table 30; (9) see table  
14; (10) see tables 30, 31. (a) Analyses at ORNL; (b) analyses by J.  
McCarthy at U.T. AEC Laboratory; (c) analyses by J. Wolfe at U.T.  
AEC; (d) work by J. Wolfe at U.T. Data in  $\mu\text{c}/100\text{g}$ .

Code	1956 <sup>a</sup>	1957 <sup>a</sup>	1958 <sup>b</sup>	1959 <sup>c</sup>	1960 <sup>d</sup>
1		.0002	(1)	.0068	(3)
2	.0022				
3	.0007	.0018	(2)	.0025	.0040
4			.0017	.0036	
5	.0046				
6	.0030		.0007		
7			.0003	.0022	.0030
8			.0014		
9			.0011		
10			.0003		
11				.0070	
12	.0001	.0070	.0018	.0054	
13	.0003		.0026		
14		.0130	.0016	(10)	.0003
15		.0002	.0017	.0009	.0030
16			.0003	(8)	.0080
17			.0010		
18			.0003	.0010	(3)
19			.0034		
20			.0028	.0023	.0030
21			.0011	.0027	
22			.0002	.0009	.0010
23				.0076	.0110
24			.0003		
25			.0015	(8)	
26			.0005		
27			.0010		
28				.0071	
29					.0010
30				.0018	
31			.0003	.0018	
32	leaf				
	branch			.0013	
33	tops			.0012	
34	tops			.0042	
35	leaf			.0023	
	branch				
36					
37	leaf			.0014	
	branch			.0029	
38	leaf				
	branch				
39	wood & bark				
	whole tree		(9)	.0009	.0030
	bark	(4)	.0011	.0170	
	wood	(5)	(6)	(7)	
	leaf		.0007	(8)	(3)

Table 27. Cobalt-60 in lake bed plants. (1) See table 3, 6, 9, 12; (2) see table 13; (3) see table 34; (4) .0004, .0003; (5) .0002, .0002; (6) .0001, .0004; (7) .0005, .0005, .0019; (8) see table 30; (9) see table 14; (10) see tables 31, 32. (a) Analyses at ORNL; (b) analyses by J. McCarthy at U.T. AEC Laboratory (c) analyses by J. Wolfe at U.T. AEC; (d) analyses by J. Wolfe at U.T. Data in  $\mu\text{c}/100\text{g}$ .

Code	Ruthenium-106		Zirconium-Niobium-95	
	1956	1957	1956	1957
1		.0001		
2	.0045		.0020	
3	.0007	.0003	.0006	
4				
5	.0030		.0001	
6	.0023		.0006	
7				
8				
9				
10				
11				
12	.0006	.0004	.0007	
13	.0005	.0004	.0002	
14		.0002		.0027
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32	leaf			
	branch			
33	tops			
34	tops			
35	leaf			
	branch			
36				
37	leaf			
	branch			
38	leaf			
	branch			
39	wood & bark			
	whole tree			
	bark	.0004		.0004
	wood	.0002		.0005
	leaf			

Table 28. Ruthenium-106 and zirconium-niobium-95 content of lake bed plants. Analyses at ORNL laboratories, data in  $\mu\text{c}/100\text{g}$ .

Taxon	Code	Stake	C	N	Na
Salix tops	15	13L	49.32		77
" "	St	13L	47.83	.70	
Salix leaves	22	12L	51.09	.78	110
" "	23	13L	51.47	1.08	85
" "	17	12M	50.71	1.55	110
" "	27	13M	52.03	.84	106
Ambrosia					
<i>artemisiifolia</i>	16	6G	45.73	.92	123
" "	18	8G	45.64		64
" "	26	11H	46.12		119
" "	29	9H	46.51		118
Boehmeria					
<i>cylindrica</i>	7	15M	44.90	.67	57
" "	19	12M	44.82	1.40	143

Table 29. Composition of plants from lake bed in 1959.  
 Carbon and nitrogen in percents, sodium in p.p.m.  
 Analyses for carbon at ORNL; for nitrogen and sodium at  
 U.T. by J. Wolfe.

Code	Ca <sup>a</sup>	K <sup>a</sup>	Mg <sup>a</sup>
15 St	5962	6048	5682
22	6798	10417	2303
23	9149	7660	2128
17	7456	11623	2632
27	5556	11111	2910
16	10822	21096	5479
18	9958	21186	3814
26	7723	23366	4455
29	14427	28458	4743
7	19602	15057	5682
19	17184	19809	5489

Code	P <sup>a1</sup>	P <sup>a2</sup>	Cs-137 <sup>b</sup>	Co-60 <sup>b</sup>	Sr-90 <sup>b</sup>
15 St	1345 1218	1448	.0010	.0009	.0103
22	1842	1754	.0013		.0158
23	1564	1915	.0030		.0162
17	1747	2412	.0039	.0039	.0250
27	1923	2116	.0026	.0021	.0183
16	4271	4658	.0140	.0014	.0984
18	4232	4555	.0110	.0015	.0977
26	4747	5446	.0150	.0022	.0849
29	3865	6324	.0170	.0024	.1474
7	5148	6108	.0080	.0043	.1500
19	4329	5012	.0043	.0012	.1077

Table 30. Composition of plants from lake bed in 1959. Phosphorus (1) of one gram wet digestates, (2) of a solution prepared from ashed tissue. All analyses by J. Wolfe except strontium-90 done at ORNL. (a) Results in p.p.m.--work done at U.T., (b) results in  $\mu\text{c}/100\text{g}$ , cesium-137 and cobalt-60 work done at U.T. AEC laboratory. Code as in table 29.

Code	Stake	C <sup>a</sup>	Na <sup>b</sup>	Ca <sup>b</sup>	K <sup>b</sup>
1	7H		139	15460	19499
2	12D				
3	13G				
4	8A				
5	9D				
6	11E	43.55	49	11284	19844
7	9C				
8	11D				
9	5C				
10	12G				
11	6B				
12	12C				
13	5D				
14	14A				
15	11H				
16	15M				
17	9B				
18	13D				
19	11C				
20	9G				
21	10J				
22	13G				
23	11A	44.83	46	11883	21605
24	13E				
25	6D				
26	13B				
27	12H				
28	6E				
29	10C		53	10407	21116
30	8E		43	13853	22078
31	11B				
32	9E				
33	7G				
34	8D	42.70	95	10335	24163
35	12E				
36	10I				
37	7A				
38	10B				
39	10D				
40	9I				

Table 31. Composition of *Impatiens capensis* from the lake bed in 1959. (a) Analyses at ORNL, carbon in percent; (b) analyses by J. Wolfe at U.T. expressed as p.p.m.

Code	Mg <sup>b</sup>	P <sup>b1</sup>	P <sup>b2</sup>	Cs-137 <sup>c</sup>	Co-60 <sup>c</sup>	Sr-90 <sup>a</sup>
1	3760	5432		.0136	.0042	.226
2				.0047	.0032	
3				.0035	.0015	
4			3198	.0050	.0027	
5				.0032	.0016	
6	3113	6128	5631	.0074	.0017	.151
7				.0052	.0022	
8				.0094	.0016	
9				.0021	.0024	
10				.0111	.0033	
11				.0014	.0026	
12				.0065	.0024	
13				.0028	.0021	
14				.0016	.0010	
15				.0075	.0017	
16				.0031	.0020	
17				.0031	.0013	
18				.0065	.0049	
19				.0025	.0058	
20				.0091	.0011	
21				.0202	.0041	
22				.0440	.0071	
23	3395	4784	4525	.0031	.0025	.206
24				.0075	.0054	
25				.0042	.0012	
26				.0031	.0026	
27				.0079	.0030	
28			4484	.0057	.0029	
29	3167	4826	4654	.0057	.0012	.134
30	2489	7468		.0050	.0050	.235
31				.0021	.0027	
32			4733	.0065	.0028	
33				.0053	.0030	
34	2620	5386	4788	.0068	.0007	.153
35				.0086	.0019	
36				.0122	.0031	
37			5912	.0023	.0032	
38				.0009	.0066	
39				.0059	.0013	
40				.0135	.0025	

Table 31. Composition of *Impatiens capensis* from the lake bed in 1959.  
 (a) Analysis at ORNL in  $\mu\text{c}/100\text{g}$ ; (b) analyses by J. Wolfe at U.T. expressed as p.p.m.; (c) analyses by J. Wolfe at U.T. AEC Laboratory in  $\mu\text{c}/100\text{g}$ . Phosphorus (1) of one gram wet digestates, (2) of a solution from ash from muffled tissue.

Code	Stake	C <sup>a</sup>	Na <sup>b</sup>	Ca <sup>b</sup>	K <sup>b</sup>
41	9A				
42	5E				
43	8H				
44	8G				
45	9H				
46	12B				
47	8F	42.84	48	10256	21795
48	6F				
49	7D				
50	11G				
51	10E				
52	9F				
53	13A				
54	11K				
55	5F				
56	10H		103	9270	23221
57	13F				
58	13I		146	16117	23443
59	12F				
60	13H				
61	10A				
62	11F				
63	6G				
64	11I				
65	8C				
66	7F				
67	8I				
68	10F				
69	13C				
70	8B				
71	10G	44.01	29	9942	21491
72	7E				
73	7C				
74	7B				
75	6C				

Table 32. Composition of Impatiens capensis from the lake bed in 1959. (a) Carbon analyses in percent at ORNL; (b) analyses by J. Wolfe at U.T. expressed as p.p.m.

Code	Mg <sup>b</sup>	P <sup>b1</sup>	P <sup>b2</sup>	Cs-137 <sup>c</sup>	Co-60 <sup>c</sup>	Sr-90 <sup>a</sup>
41				.0017	.0014	
42				.0054	.0018	
43				.0077	.0013	
44				.0095	.0011	
45						
46				.0034	.0038	
47	3526	6971	5647	.0101	.0024	.166
48						
49				.0053	.0015	
50						
51			5482	.0093	.0026	
52				.0141	.0016	
53				.0070	.0055	
54					.0071	
55				.0102	.0033	
56	2996	7022		.0097	.0013	.165
57				.0108	.0034	
58	3663	7692		.0158	.0033	.200
59				.0094	.0021	
60				.0124	.0071	
61				.0027	.0050	
62				.0106	.0038	
63				.0084	.0033	
64				.0136	.0020	
65				.0056	.0028	
66						
67				.0165	.0032	
68				.0095	.0033	
69				.0086	.0018	
70						
71	2485	5775	5398	.0104	.0022	.155
72				.0073	.0016	
73				.0058	.0033	
74				.0043	.0029	

Table 32. Composition of *Impatiens capensis* from the lake bed in 1959. (a) Analyses at ORNL, data in  $\mu\text{c}/100\text{g}$ ; (b) analyses by J. Wolfe at U.T., data in p.p.m.; (c) analyses by J. Wolfe at U.T. AEC Laboratory in  $\mu\text{c}/100\text{g}$ .

Taxon	Code	Stake	C <sup>a</sup>	Ca <sup>b</sup>	Mg <sup>b</sup>
Carex frankii	1	7G	43.2	6172	2542
" "	2	5E	54.7	5942	2228
" "	3	8H	49.5	5873	2389
" "	4	6F	54.1	5179	2490
" "	5	11F	44.3	5880	2292
" "	6	17G	42.9	4765	2184
" "	7	12H	46.9	6378	2189
" "	8	14F	40.8	5158	2579
" "	9	12G	42.7	4978	2389
" "	10	16E	42.1	4656	2229
" "	11	10E	42.0	5339	2768
" "	12	13G	41.9	5969	2189
" "	13	15G	43.3	5201	2270
" "	14	15E	40.5	4793	2596
Vernonia					
altissima	15	14M	46.9	7820	2248
" "	16	9E	44.9	8973	2293
Salix leaves	26	15M	52.6	9457	1390
" "	27	15M	51.7	6364	1394

Table 33. Composition of certain plants on the lake bed, 1960. (a) Carbon in percent; (b) calcium and magnesium in p.p.m. Salix leaves from different branches of the same tree. Analyses by J. Wolfe at U.T.

Code	K <sup>a</sup>	P <sup>a</sup>	Cs-137 <sup>b</sup>	Co-60 <sup>b</sup>	Sr-90 <sup>b</sup>
1	17047	980	.032	.011	.034
2	15252	990	.023	.011	.038
3	14334	1120	.053	.014	.029
4	18327	847	.036	.011	.022
5	15946	1121	.023	.014	.022
6	16877	1489	.040	.012	.017
7	12756	976	.030	.012	.030
8	16862	1537	.041	.012	.019
9	13640	1294	.035	.010	.020
10	18229	1486	.031	.009	.027
11	15522	1409	.029	.009	.020
12	15320	995	.048	.014	.018
13	14846	1395	.039	.011	.019
14	16974	1448	.038	.011	.026
15	19941	4106	.009	.004	.035
16	19541	3340	.003	.002	
26	10324	1787	.003	.002	.014
27	10154	1618	.003	.001	.017

Table 34. Composition of certain plants on the lake bed, 1960. (a) Data in p.p.m.; (b) data in  $\mu\text{c}/100\text{g}$ . Analyses by J. Wolfe at U.T. except Sr-90 done at ORNL. Code is that of table (33) preceding..

Code	Height <sup>a</sup>	Weight <sup>b</sup>	Diameter <sup>c</sup>	Ca	K	Mg	P
A	17.0	371.9	2.33	5030	2270	297	321
B	33.5	324.3	1.93	5680	1820	280	326
C	48.5	237.3	1.73	6160	1940	298	398
D	65.5	208.0	1.60	6630	1780	297	272
E	79.5	153.1	1.45	7000	2000	300	300
F	96.0	131.9	1.35	7140	1480	286	357
G	110.0	84.7	1.25	6980	1890	283	401
H	125.5	89.9	1.13	7260	2051	278	349
I	146.0	108.6	1.03	7010	1990	248	422
J	161.5	69.4	0.85	7200	2190	319	456
K	178.0	72.8	0.75	7250	2430	413	505
L	189.5	42.6	0.65	7540	2580	397	645
M	205.0	44.8	0.55	7540			
N	219.0	34.2	0.45	7380	2550	331	757
O	231.0	13.5	0.30	7380			
P	247.5	9.0	0.13	8670	3700	426	1279

Table 35. Characteristics of *Salix* tree 15 from the lake bed, collected 22 October, 1960. Chemical data in p.p.m.; analyses by J. Wolfe at U.T. (a) Height is that of stem--the segment (includes branches but not leaves) above ground in inches; (b) weight is that of the segment in grams; (c) diameter is that of the bole portion of the segment only at its mid-length.

Diameter Class	Sample Number						
	1956 1 <sup>a</sup>	1 <sup>b</sup>	2 <sup>b</sup>	3 <sup>b</sup>	1957 4 <sup>b</sup>	5 <sup>b</sup>	6 <sup>c</sup>
0-.09	27	1	3	3	4	6	16
.1-.19	8	4	7	5	3	8	15
.2-.29	1	8	5	4		2	10
.3-.39		4	3		3	2	2
.4-.49		3		1	4	3	1
.5-.59			1				
.6-.69			1	1			4
.7-.79		1					1
.8-.89							1
.9-.99							1
1.0-1.09							
1.1-1.19							1
1.2-1.29							
1.3-1.39							
1.4-1.49							
1.5-1.59							
1.6-1.69						1	

Table 36. 1956 and 1957 distribution of Salix stem diameters (breast height in inches). The one 1956 sample includes two dead stems, (a) sample area one m<sup>2</sup>; (b) area 1.44 m<sup>2</sup> each; (c) a 3 m<sup>2</sup> sample.

Diameter Class	Sample Number																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
0-.09		7	4	2	1	6	5	5	8	1	10	7	10	3	4	2	5	4	10		
.1-.19	3	6	4	5	1	5	9	5	5	6	5	3	1	4	2	1	1	4	6	3	
.2-.29	4	3	1	4	2	1	2	3	1	5	1	5	1	3	3	5		4	1		
.3-.39	3	1	1		2	2	2	2	2	2	1	3	2	2	2	1		5	2		
.4-.49	1	1	1	4		2	1			0	1				3		1	1			
.5-.59	2	1	1	1		2	1				3					1	2	2			
.6-.69	3				1	1			1							1	1	2			
.7-.79	1	1	1		2	3	1		1						1		2	1			
.8-.89				1	2	2	2										1	1			
.9-.99	1	1			1	1									1						
1.0-1.09		1									1										
1.1-1.19	1															1		1			
1.2-1.29					1																
1.3-1.39								1									1				
1.4-1.49																					
1.5-1.59						1	1														

Table 37. 1958 distribution of stem diameters (breast height in inches) among trees in 20 m<sup>2</sup> Salix thicket samples.

Diameter Class	Sample Number																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0-.09														1						
.1-.19						1	1	1	2	1	1	1	1	1						
.2-.29	1	1		2	1	3		2	3	2	1	1	3	1	1	3	3	4	2	
.3-.39	2	1	1	2	1		2		3			1	3				2	2	1	
.4-.49	3		1			1	1		1	2	2	1	2	2				1		
.5-.59	2	1	1	1	3	1	1	1	1		2	1	1	2	1	3		3	2	
.6-.69	1	1		1			1				2		1	2				3	2	
.7-.79	2			1		1	1							1	1	1			1	
.8-.89	2					1						1				1	2			
.9-.99		3	1		1	1					1						1	1		
1.0-1.09				1		3	2			1										
1.1-1.19					1	1													1	
1.2-1.29	1						1								2	2				
1.3-1.39		1	1																	
1.4-1.49																				
1.5-1.59			1												1					
1.6-1.69							1													
1.7-1.79		1																		
1.8-1.89																				
1.9-1.99																		1		
2.0-2.09																			1	
2.1-2.19											1									
2.2-2.29										1									1	

Table 38. 1959 distribution of stem diameters (breast height in inches) among trees in 20 m<sup>2</sup> Salix thicket samples.

Diameter Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0-.09																	1	1	1	
.1-.19										1						1	1	2		
.2-.29	2	1	1			2			1			1	1							
.3-.39	1			1	2	2		2		1	1		1	1			2	1		
.4-.49	1	1	1	1	1			1	2	1	1	2	2	1			1	2		
.5-.59	1			2	1	1				1	1			2	1	1	2	1		
.6-.69						1										2	2	1		
.7-.79		1	1		1					1					1		1			
.8-.89	2			1	2	1	1									1				
.9-.99	2					1					1					1				
1.0-1.09		2	1	1		1	1				1						1			
1.1-1.19			3	1					1								1			
1.2-1.29																				
1.3-1.39																1	1	2		
1.4-1.49	1					1										1				
1.5-1.59		1	1				1										1			
1.6-1.69																		1		
1.7-1.79																		1		
1.8-1.89															1					
1.9-1.99																				
2.0-2.09							1													
2.1-2.19	1																			
2.2-2.29								1												
2.3-2.39									1								1			
2.4-2.49																				
2.5-2.59																				
2.6-2.69																1				
2.7-2.79																1				
2.8-2.89									1											

Table 39. 1960 distribution of stem diameters (breast height in inches) among trees in 20 m<sup>2</sup> Salix thicket samples.

	1959	1960
0-.099	8e	9
.1-.199	10	11
.2-.299	9	10
.3-.399	6	5
.4-.499	5	6
.5-.599	5	2
.6-.699	2	3
.7-.799	1	1
.8-.899	2	1
.9-.999		
1.0-1.099	1	
1.1-1.199		1

Table 40. 1959 and 1960 distribution of Salix stem diameters (breast height in inches) among trees in the area between stakes 8D-8E-9D-9E.  
8e is estimated number.

1958		Boehmeria	Eulalia	Carex	Impatiens	Total
1960						
7.3	139.8					
16.1	115.4	90.2	4.3	15.9	5.7	116.1
21.1	133.8	76.2	0.3	7.2	44.7	128.3
22.8	151.3	173.1				173.1
6.8	130.7	79.3	0.3	1.6	9.7	90.9
8.0	153.5	108.4	2.3	43.5	26.5	180.7
24.4	127.7					
20.7	76.0	71.2				71.2
20.2	114.8	122.2				122.2
13.6	141.7	61.2	0.3	10.7		72.2
		114.8		13.2		128.0

Table 41. Salix understory clip weights. 1958 samples each 1600 cm<sup>2</sup> in size. Litter mostly fresh as older material was removed by flooding. 1959-60 samples each one m<sup>2</sup>.

Year	Number leaves	Weight	Weight per leaf	Average
1957	300	10.00	.033	.033
1958	200	11.44	.057	
	200	12.73	.064	
	200	12.47	.062	
	200	10.50	.053	.059
	200	10.98	.055	
	200	12.74	.064	
1960	100	6.7	.067	
	100	6.6	.066	
	100	6.0	.060	.059
	100	5.3	.053	
	100	4.8	.048	

Table 42. Weights of leaves sampled three different years. Each sample from different branches on different trees. Weights in grams.

Diameter	Number of Buds	Weight of Stem
1		
2		
3		
4	198, 347, 91	7, 12, 5
5	388, 467, 152, 245	16, 13, 8, 10
6	294, 332, 293, 260	31, 17, 24, 22
7	644, 957, 360, 257, 271, 94, 349	21, 36, 27, 26, 21, 27, 37
8	1425, 303, 207	49, 29, 25
9	397, 373, 206	42, 53, 57
10	2300, 370, 220, 513	110, 53, 60, 67
11	398, 573, 1130, 573, 771	68, 64, 79, 76
12	295, 428, 852	92, 80, 82
13	1030, 497, 746, 452	94, 112, 128
14	825, 421, 606	119, 104, 111
15	967, 383, 434, 165, 762	159, 119, 142, 168, 114, 174
16	469, 430	135, 171, 110
17	2278	211
18	2182, 1246	266
20	2818	290
21	1981	380
22	1411	377
23	2785, 3833	515, 505
26	2426	501
30	4265	852
32	5548, 6624	974, 1188
47	10, 456	1512

Table 43. Numbers of buds and weight of entire stems of *Salix* trees collected on lake bed October, 1958. D is diameter in mm at 50 cm height, weight in grams.

D <sub>50</sub>	D B H
7	4
8	5
9	7, 4, 5, 7, 5, 6, 5, 6, 6, 7
10	7, 7, 7, 7, 7, 8, 8
11	8, 5, 9, 8, 9, 6, 8
12	9, 9, 9, 9
13	10, 10, 9, 9, 7, 10
14	10, 11, 9, 9, 10, 12
15	10, 11, 11, 12, 10, 10, 11
16	12, 13, 12, 12, 11, 13, 12
17	12, 13
18	14, 12, 14, 13, 13
19	15, 14, 14, 15
20	15, 16, 15, 15, 15
21	17, 17, 15
22	17, 19, 18, 17
23	17
24	18, 19, 16, 18
25	19, 19, 21, 20, 19, 21, 18, 19
26	22, 19
27	22, 22, 20
28	23, 22, 22
29	23, 20
30	25, 22
31	22
32	25
33	25, 26, 27
35	30, 27, 30
36	29
38	31
40	35
44	39
45	35
48	40

Table 44. 1958 diameter measurements in mm at 50 cm height on Salix stems and measurement of breast height on the same tree. 118 trees measured.

Tree No.	DBH	Ht.	Number	Weight	Weight	
			Branches	Branch	Total	Bole
1	.865	4.56	21-0-21	22-0-22	507	485
2	.400	3.15	10-3-13	3-4-7	115	108
3	1.045	5.02	9-11-20	33-12-45	1097	1052
4	.335	2.27	16-7-23	4-2-6	64	58
5	.543	3.50	1-6-7	1-3-4	198	194
6	1.200	6.34	32-32-64	64-65-129	1287	1158
7	1.848	7.20	31-30-61	225-119-344	2825	2481
8	.630	2.80	10-13-23	11-18-29	247	218
9	.350	2.70	2-0-2	2-0-2	71	69
10	1.115	5.23	9-0-9	13-0-13	947	934
11	.775	4.40	7-1-8	24-4-28	406	378
12	.935	4.90	15-0-15	11-0-11	633	622
13	1.795	6.80	27-19-46	274-79-353	2800	2447
14	2.490	8.39	44-30-74	298-162-460	4758	4298
15	1.590	6.50	20-25-45	161-91-252	2072	1820
16	1.455	5.45	16-15-31	52-25-77	1623	1546
17	1.691	7.00	42-12-54	228-28-256	2768	2512
18	2.322	8.37	51-39-90	521-172-693	5094	4401
19	3.219	8.27	67-47-114	1138-472-1610	8802	7592
20	2.250	7.58	51-29-80	408-283-691	4636	3945
21	2.675	8.36	43-20-63	800-224-1024	6736	5712
22	1.295	6.06	31-16-47	124-43-167	1454	1287
23	2.000	5.96	56-27-83	339-296-635	2966	2331
24	2.930	8.46	28-19-47	728-144-872	7843	6971
25	2.150	7.70	30-5-35	163-61-224	4007	3683
26	3.035	8.15	26-36-62	277-371-648	6853	6204
27	3.832	7.68	61-21-82	3015-684-3699	13790	10096

Table 45. Characteristics of 27 Salix trees cut 22 October, 1960 on the lake bed near 31-0. DBH is in inches; Ht. is in meters; Number of branches is in the order: live-dead-total; Weight of branches is in the same order; Total includes bole and all branches.

Height	Tree Number								
	1	2	3	4	5	6	7	8	9
GR	1.31	.70	1.77	.59	.92	1.68	2.62	1.08	.60
0.1m	1.23	.66	1.68	.70	.87	1.62	2.38	1.00	.58
0.5m	1.08	.55	1.48	.45	.70	1.44	2.12	.87	.53
1.0m	.91	.50	1.24	.37	.59	1.38	1.90	.69	.40
1.5m	.83	.40	1.05	.31	.51	1.10	1.72	.57	.29
2.0m	.72	.35	.95	.20	.43	1.00	1.61	.44	.21
2.5m	.63	.22	.86		.33	.98	1.50	.33	.09
3.0m	.75	.05	.75		.20	.84	1.40		
3.5m	.48		.69		.03	.75	1.23		
4.0m	.38		.62			.67	1.08		
4.5m	.20		.38			.57	.97		
5.0m			.21			.48	.77		
5.5m						.35	.62		
6.0m						.13	.48		
6.5m							.22		
7.0m							.14		
Height	Tree Number								
	10	11	12	13	14	15	16	17	18
Gr	1.60	1.13	1.41	2.59	3.14	2.63	2.27	2.93	3.28
0.1m	1.50	1.08	1.38	2.50	3.10	2.45	2.14	2.81	3.00
0.5m	1.35	.95	1.21	2.22	2.82	1.98	1.87	2.23	2.64
1.0m	1.27	.83	1.03	2.00	2.58	1.72	1.63	1.88	2.35
1.5m	1.07	.75	.97	1.68	2.24	1.49	1.40	1.73	2.11
2.0m	.99	.65	.85	1.58	1.92	1.27	1.23	1.62	2.03
2.5m	.88	.60	.73	1.47	1.87	1.21	1.05	1.49	1.90
3.0m	.79	.44	.56	1.37	1.82	1.15	.99	1.38	1.84
3.5m	.65	.34	.45	1.23	1.69	.95	.92	1.18	1.82
4.0m	.54	.15	.30	1.05	1.52	.85	.74	1.05	1.67
4.5m	.42		.18	.83	1.33	.66	.61	.95	1.45
5.0m	.23			.75	1.23	.58	.39	.73	1.43
5.5m				.46	1.15	.47		.58	1.28
6.0m				.31	.90	.22		.37	1.03
6.5m				.13	.79	.05		.29	.93
7.0m					.52			.06	.58
7.5m					.36				.42
8.0m					.19				.18

Table 46. Diameters at tenth to half meter intervals of Salix boles, collected October, 1960, at 31-0, on the lake bed. GR is ground level, measurements are in inches.

	Tree Number								
Height	19	20	21	22	23	24	25	26	27
GR	4.40	4.25	3.73	2.13	3.40	4.50	3.24	4.10	5.06
0.1m	4.25	3.56	3.55	2.00	2.93	3.88	3.17	3.51	4.72
0.5m	3.68	3.28	3.11	1.64	2.56	3.62	2.61	3.21	4.13
1.0m	3.46	2.86	2.75	1.44	2.13	3.02	2.35	2.95	3.74
1.5m	3.05	2.38	2.53	1.18	1.89	2.80	2.08	2.75	3.37
2.0m	2.73	2.15	2.34	1.12	1.72	2.60	1.91	2.42	3.21
2.5m	2.61	1.99	2.23	1.01	1.60	2.38	1.75	2.20	2.83
3.0m	2.53	1.83	2.12	.91	1.35	2.25	1.62	2.13	2.40
3.5m	2.25	1.70	2.02	.83	1.18	2.02	1.47	1.97	2.08
4.0m	2.00	1.59	1.82	.68	.94	1.90	1.27	1.77	1.95
4.5m	1.73	1.45	1.60	.60	.65	1.65	1.12	1.63	1.66
5.0m	1.52	1.27	1.42	.40	.44	1.59	1.06	1.55	1.43
5.5m	1.47	1.00	1.25	.18	.25	1.43	.78	1.28	.95
6.0m	1.15	.92	1.04	.07		1.18	.65	1.05	.73
6.5m	.92	.75	.78			1.03	.45	.85	.50
7.0m	.48	.47	.50			.75	.29	.50	.22
7.5m	.28	.22	.32			.45	.12	.24	.08
8.0m	.15	.08	.14			.18		.09	

Table 47. Diameters at tenth to half meter intervals of Salix boles, collected October, 1960 at 31-0 on the lake bed. GR is ground level, measurements are in inches.

Taxon	Sample Number							
	1	2	3	4	5	6	7	8
Carex spp.	16.0	10.2	13.6	13.0	25.0	8.9	11.7	8.8
Cyperus spp.					11.8	7.9	24.0	49.5
Eleocharis obtusa	3.4	5.5	1.3	1.6	3.7		13.6	
Juncus spp.	76.5	47.3	30.7	27.0	70.8	42.9	48.1	67.5
Eulalia viminea	2.0		0.9	1.4			1.8	1.0
Panicum capillare				1.0				
Panicum dichotomiflorum			2.0	5.8	3.3			0.7
Echinochloa spp.						61.3	8.5	78.3
Gramineae unknown	3.2	0.5			6.3	1.7	6.0	1.8
Polygonum spp.	800.0	661.7	755.8	823.5	552.0	818.4	740.9	583.7
Trifolium repens				0.4				
Oenothera biennis					6.3			
Lespedeza sp.							0.4	
Lycopus americanus								0.8
Rumex crispus	3.4							
Compositae unknown	3.9							
Bidens frondosa	16.9	0.7	57.2	7.9			58.2	2.3
Solidago sp.						1.5		
Eupatorium serotinum								0.8
Ulmus sp.					0.4			
Salix nigra					0.2			
Unknown			1.3					
Litter	182.2	171.4	246.9	218.3	213.2	214.2	225.6	172.3

Table 48. Weight by species component of eight one m<sup>2</sup> contiguous samples of the Polygonum stand October, 1956. Collected 8G-9G.

Area	Stake	Type	Wt. g
1 Juncus stand	7B	fresh	351.1
		litter	263.3
		total	614.4
2 Juncus stand	7C	fresh	619.8
		litter	337.7
		total	957.5
3 Juncus stand	9C	fresh	1971.9
		litter	551.0
4 Carex stand	10C	fresh	1147.3
		litter	495.8

Table 49. Sample 1 and 2 each one m<sup>2</sup> collected 17 May, 1957.  
 Samples 3 and 4 each 2 m<sup>2</sup> collected 7 June, 1957. Carex  
 litter contains 276.7 g of standing dead Polygonum.

JUNCUS-CAREX-FORBS

Stakes	Ft.	1	Litter
6E-6D	1	3	53.2
"	5		68.8
"	129.4	66.3	
"	161.3	118.4	
"	144.1	105.3	
"	95.4	209.3	
"	132.0	182.1	
6D-5D	122.4	114.0	
"	207.4	164.7	
"	170.2	139.8	
<hr/>		<hr/>	<hr/>
Average	138.5	122.2	

BIDENS

Stake	Fresh	Litter
15F-14E	90.6	59.7
"	101.5	66.8
"	106.9	70.3
"	95.0	62.5
"	36.4	89.8
"	136.0	130.1
"	145.6	70.1
"	129.0	76.6
"	162.2	101.0
"	141.5	93.2
<hr/>		<hr/>
Average	124.5	76.7

JUNCUS-EULALIA

9B-10A	134.8	169.2
"	229.1	191.5
"	162.9	107.3
"	97.3	123.1
<hr/>		<hr/>
Average	156.0	147.7

LESPEDEZA-FORBS

4B-4C	162.1	58.0
"	78.3	76.4
"	159.0	60.5
"	91.8	53.9
5B-4B	118.4	81.7
"	130.8	57.6
"	171.5	108.7
"	154.4	118.7
	40.3	172.8
	107.6	40.0

CAREX-EULALIA

9B-10A	144.0	116.3
"	179.1	148.5
"	83.4	38.0
"	81.4	57.2
"	125.5	76.4
<hr/>		<hr/>
Average	122.5	87.3

POLYGONUM-BIDENS

8G-9G	123.6	73.2
in	192.8	60.1
1956	153.2	37.3
sampling	121.0	89.2
area	214.2	133.9

JUNCUS-IMPATIENS

West	126.6	153.1
of	59.4	60.7
11J	51.9	73.7
"	77.5	46.6
"	64.6	52.8
<hr/>		<hr/>
Average	76.0	77.4

Average 145.8 103.3

Table 50. Weight of 1600 cm<sup>2</sup> samples of herb community and litter, October, 1957. Samples collected on line between designated stakes beginning at the first; Bidens and Juncus-Carex-Forbs spaced four feet apart, other series with individual samples in a contiguous arrangement.

JUNCUS-FORBS

Stake	Fresh	Litter
11E-11D	19.1	68.6
"	78.3	81.1
"	101.8	89.2
"	53.7	141.8
"	83.8	250.9*
"	57.1	30.3
"	125.0	244.7
<hr/>		
Average	74.1	109.3

CAREX-FORBS

13E-13D	148.5	103.4
12D-13D	79.4	48.5
"	139.6	41.5
"	69.4	145.6
"	56.0	32.9
"	119.3	27.6
"	94.6	120.9
13D-13E	118.7	189.4
"	119.3	99.8
"	85.2	11.5
<hr/>		
Average	103.0	82.1

LOW JUNCUS-CAREX-FORBS

Stakes	Fresh	Litter
12I-13I	53.6	91.4
"	71.7	45.0
"	111.6	86.3
"	71.3	89.4
"	68.9	87.7
"	42.4	41.0
"	45.5	87.2
"	45.2	25.4
"	51.0	49.5
<hr/>		
13I-13H	56.9	87.3
"	72.8	33.7
"	46.6	60.7
"	80.7	69.0
12J-11J	78.5	88.2
"	65.3	54.6
"	21.6	156.9
"	90.7	47.4
"	43.7	125.5
"	22.3	109.7
"	69.0	122.0
<hr/>		
Average	60.5	72.9

Table 51. Weight of 1600 cm<sup>2</sup> samples of herb communities and litter, October, 1957. Samples spaced four feet on line between stakes. \*Value excluded from computation.

BIDENS-CAREX-SAVANNAH

<u>Stake</u>	<u>Fresh</u>	<u>Litter</u>
15G-16G	31.3	221.6
	26.5	78.1
	54.9	171.5
	58.7	135.5
	76.9	250.3
	42.7	123.4
		65.7
	63.8	58.8
	90.0	81.1
	<u>62.9</u>	<u>140.2</u>

Average      56.4    132.6

CAREX-JUNCUS-FORBS

<u>Stake</u>	<u>Fresh</u>	<u>Litter</u>
4C-4D	66.0	159.8
	59.8	161.9
	75.6	195.0
	56.6	184.1
	83.7	171.1
	81.1	215.0
	58.9	149.6
	23.5	236.6
	42.9	104.9
	<u>54.5</u>	<u>133.2</u>

Average      60.2    171.2

JUNCUS-CAREX-EULALIA

12B-12C	45.9	192.6
	48.5	86.5
	127.0	100.5
	97.5	82.0
	78.0	104.3
	103.8	134.8
	104.2	171.9
	116.1	176.2
	82.1	157.1
	<u>69.8</u>	<u>268.0</u>

Average      87.2    147.4

CAREX-JUNCUS-EULALIA

6B-7B	51.1	80.1
	65.6	87.9
	88.3	53.2
	116.3	45.7
	129.8	116.0
	87.9	171.3
	42.8	106.9
	87.4	114.3
	62.1	81.0
	<u>64.8</u>	<u>137.4</u>

Average      79.6    99.3

LESPEDEZA-CAREX

5B-4B	62.3	178.2
	42.6	145.2
	57.4	140.6
	52.9	99.9
	72.1	150.1
	82.5	166.0
	75.7	167.2
	64.3	114.2
	62.5	143.1
	<u>86.5</u>	<u>168.0</u>

Average      65.9    147.2

Table 52. Weight of 1600 cm<sup>2</sup> herb and litter samples, October, 1958.  
Individual samples contiguous and on line between stakes.

CAREX-JUNCUS-FORBS

Stake	Fresh	Litter
9G-8G	114.2	154.9
	94.0	201.6
	69.6	89.6
	32.5	167.0
	152.4	174.3
	127.6	181.7
	90.0	211.9
	124.2	233.7
	202.8	212.4
	101.5	176.8
<hr/>		
	110.9	180.4

CAREX-FORBS

Stake	Fresh	Litter
12C-11C	68.4	132.8
	51.0	118.5
	90.5	116.3
	85.6	114.5
	51.3	75.7
	24.3	44.9
	34.3	77.3
	45.6	104.1
	71.2	196.6
	56.4	213.6
<hr/>		
	Average	57.9
		119.4

JUNCUS-CAREX

16C-17B	32.1	142.9
	37.8	97.8
	26.1	102.2
	32.5	92.5
	49.4	63.5
	49.7	66.2
	37.4	127.4
	17.1	92.2
	31.0	94.4
	25.1	181.9
<hr/>		
	33.8	106.1

BIDENS

12G-11G	70.5	81.4
	131.1	313.8
	95.4	126.6
	108.6	173.2
	87.2	166.0
	68.7	288.6
	68.7	127.9
	65.8	207.9
	101.0	81.9
	79.7	105.1
<hr/>		
	Average	87.6
		167.2

JUNCUS

8B-7C	38.6	143.1
	22.8	150.5
	33.7	97.7
	53.2	132.1
	40.0	117.3
	52.7	155.3
	49.8	272.2
	50.5	184.9
	48.0	204.7
	68.1	170.1
<hr/>		
	45.7	162.8

FORBS-CAREX-JUNCUS

12I-11I	29.1	101.1
	30.8	75.2
	37.6	136.4
	27.9	57.1
	27.1	
	52.2	98.7
	57.1	224.8
	61.3	296.4
	77.0	231.1
	67.8	223.7
<hr/>		
	Average	46.9
		166.0

Table 53. Weight of 1600 cm<sup>2</sup> herb and litter samples, October, 1958. Individual samples contiguous and on line between stakes.

JUNCUS-FORBS-CAREX 11D-10D

<u>Sample No.</u>	<u>Forbs</u>	<u>Carex</u>	<u>Eulalia</u>	<u>Juncus</u>	<u>Total</u>	<u>Litter</u>
1		14.2	4.2	35.5	53.9	181.3
2			5.3	47.7	52.9	176.7
3		10.5		38.6	49.1	169.6
4		9.0		51.0	60.0	244.2
5		68.5	26.0		94.5	185.9
6	37.8	17.5	19.3	80.7	155.3	209.7
7	32.6		18.4	85.7	136.4	155.8
8	14.2		3.7	170.2	188.1	177.6
9	42.5		18.5	82.2	143.2	183.7
10	7.9		2.2	60.0	70.1	103.8
					Average	100.3
						178.8

JUNCUS-FORBS-CAREX 8D-7D

1			2.8	82.3	85.1	157.0
2	27.2		18.6	66.5	112.3	157.0
3			22.5	71.7	94.2	210.0
4	2.7	16.2		49.3	68.2	177.0
5	12.7	20.0	2.7	16.7	52.1	257.0
				Average	82.6	192.0

CAREX-JUNCUS-FORBS 9H-8H

1	4.0	81.3			85.3	153.0
2	17.6	31.4	0.6	46.8	96.4	168.0
3		84.6			84.6	164.0
4	2.5	67.6	2.0		72.1	71.0
5	12.1	55.4	1.5		69.0	160.0
6	7.8	44.5			52.3	181.0
7	2.9	82.2	0.1		85.2	116.0
8	5.3	92.0			97.3	131.0
9		106.8	0.7	7.2	114.7	111.0
10		107.2	0.1	50.0	177.3*	126.0
				Average	84.1	138.1

Table 54. Weights of 1600 cm<sup>2</sup> herb and litter samples by important component, October, 1959. \* Excluded value. Forbs are Eupatorium serotinum, Aster dumosus, and Solidago spp. All litter was washed before oven-drying.

LESPEDAZA 4B-5A

Sample No.	Lespedeza	Carex	Eulalia	Juncus	Total	Litter
1	160.1	0.6	2.0	2.5	165.2	252.6*
2	133.3	0.3			133.6	171.5
3	125.7		11.7		137.4	77.8
4	133.0	16.6			149.6	90.0
5	139.1	6.6			145.7	106.5
6	158.2				158.2	97.1
7	199.0	0.5			199.5	92.4
8	191.3				191.3	168.7
9	229.7				229.7	183.3
10	187.0	0.8			187.8	174.9
					Average	169.8
						129.1

JUNCUS-CAREX-EULALIA-FORBS 7E-6E

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter
1	2.3	39.5		79.3	121.1	161.0
2	3.8	14.8	3.1	60.0	81.7	99.0
3		20.1	1.3	91.4	112.8	133.0
4				134.2	134.2	118.0
5		1.2	2.3	98.6	102.1	280.0
6			6.7	92.4	106.4	257.0
7		61.4	31.2		92.6	190.0
8		31.4	8.8	54.0	93.9	113.0
9		30.4	13.9	63.8	111.4	97.0
10		37.8	5.7	70.7	114.2	176.0
					Average	107.0
						163.4

JUNCUS-FORB-CAREX 16B-17B

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter
1	1.5	22.4		61.5	85.4	165.0
2	5.9	9.3		76.2	91.4	111.0
3		2.3		74.7	77.0	94.0
4	7.7		0.3	53.6	61.0	134.0
5	10.8			42.2	53.0	197.0
6	7.9			91.6	99.5	147.0
7		1.0		97.3	98.3	79.0
8		1.1	0.6	58.9	40.6	177.0
9		13.1	9.8	66.6	89.0	126.0
10		20.3	15.1	81.0	116.4	47.0
					Average	81.2
						127.7

Table 55. Weights of 1600 cm<sup>2</sup> herb and litter samples by important components, October, 1959. Juncus litter washed.

\*Excluded value.

CAREX-FORBS 12D - 12C

Sample No.	Forb	Carex	Eulalia	Total	Litter
1	1.2	50.6		51.8	197.0
2	1.4	5.2	0.1	6.7	195.0
3	0.5	48.7	0.2	49.4	176.0
4		108.1		108.1	154.0
5	3.6	44.8		48.4	120.0
6	0.1	52.5		52.6	152.0
7	19.7	45.7		65.4	93.0
8	1.4	32.6	7.3	41.3	73.0
9	4.3	40.7	0.5	45.5	100.0
10		75.5	2.1	77.6	98.0
<hr/>					
Average					
54.6					
<hr/>					

Table 56. Weights of 1600 cm<sup>2</sup> herb and litter samples by important component, October, 1959. Litter washed. Forbs are Eupatorium serotinum, Aster dumosus, and Solidago spp.

CAREX

Sample No.	Dead	Live	Total	Percent alive
1	227.8	3.3	231.1	1.4
2	189.6	4.5	194.1	2.3
3	304.9	26.8	331.7	8.1
4	248.5	22.5	271.0	8.3
5	242.4	7.1	249.5	2.8
<hr/>				
Average				
255.5				
4.5				

JUNCUS

1	187.3	13.1	200.4	6.5
2	200.7	22.5	223.2	10.1
3	233.9	27.5	261.4	10.5
4	252.4	19.3	271.7	7.1
5	298.2	32.6	330.8	9.9
<hr/>				
Average				
257.5				
8.8				

Table 57. Clips of Carex and Juncus made in February, 1959. Carex was adjacent to 12C clip, Juncus was adjacent to 8B clip of previous autumn, 1958. Average Carex weight in autumn was 1773 g, of Juncus 234.6. Increased weight of both suggests growth after sampling and percentage alive suggests some overwintering.

CAREX-EULALIA-JUNCUS-6C-5D

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter
1	1.1	22.2	8.9	1.7	33.9	201.7
2	3.4	30.5	8.2	4.1	46.2	222.5
3	2.4	30.4	22.1	0.8	55.7	127.6
4	5.8	15.6	20.0	61.8	103.2	114.1
5	6.3	28.7	41.3	4.9	81.2	117.9
6	7.3	29.7	24.7	2.2	63.9	194.7
					Average	64.0
						163.1

CAREX-EULALIA-JUNCUS 10B-11C

1		33.7	18.3	1.1	53.1	232.6
2	0.1	63.1	14.7	16.4	94.3	282.7
3	0.1	48.5	9.1	26.2	83.8	332.4
4	0.6	54.6	7.2	10.8	73.5	154.0
5	15.4	39.1	9.2	0.1	64.3	237.5
6	13.2	64.3	7.7		85.2	347.9
7	16.5	47.0	1.0	0.1	64.6	259.1
8	6.5	69.0	5.6		81.1	231.6
9	13.0	42.4	13.3	12.0	80.7	
					Average	75.6
						259.7

Table 58. Weights of herb and litter samples by important component, October, 1960. Samples each 1600 cm<sup>2</sup>; forbs are Eupatorium spp., Aster spp., and Solidago spp.

EULALIA-FORBS-CAREX 8C-9C

Sample No.	Forbs	Carex	Eulalia	Juncus	Woody	Total	Litter
1	6.3	21.8	23.2			51.3	231.9
2	9.4	2.0	55.2	2.2		68.8	276.6
3	14.4		40.9			55.3	196.0
4	33.6	8.2	14.5		2.8	59.1	271.6
5	1.7	3.3	60.6	0.5	8.0	74.1	133.9
6	1.3	13.8	62.8		1.9	79.8	162.9
						Average	64.7
							212.2

JUNCUS-EULALIA-CAREX 13C-14C

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter
1	4.5	14.6	15.8	13.3	48.2	195.6
2		18.3	2.4	18.5	39.2	200.5
3	3.0	28.9	44.7	13.2	89.9	184.5
4	0.4	46.0	45.2	26.0	117.6	206.5
5	0.2	12.2	51.2	38.8	102.4	142.2
6		15.7	20.4	27.7	63.8	294.3
7		9.9	4.6	62.0	76.5	235.5
8	0.5	16.8	10.6	36.6	64.5	177.9
9		17.1	23.5	25.8	66.4	158.2
10	1.3		24.3	24.3	50.9	273.1
					Average	71.9
						206.8

JUNCUS-EULALIA-FORBS 10C-11C

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter
1	8.6	13.3	23.1	76.3	121.3	262.7
2	31.3	33.8	37.3	34.9	137.3	203.3
3	75.5	6.8	46.9	10.3	139.5	221.7
4	4.2	6.2	29.1	66.9	106.4	245.9
5	4.0	43.6	6.5	50.2	104.3	240.3
6	40.6	52.4	7.0	24.0	124.2	206.9
					Average	122.2
						230.1

Table 59. Weights of herb and litter samples, each 1600 cm<sup>2</sup> area, by important component October, 1960. Forbs are Eupatorium spp., Solidago spp., and Aster spp.

LESPEDA-EULALIA-JUNCUS 4B-3A

Sample No.	Lespedeza	Carex	Eulalia	Juncus	Forbs	Total	Litter
1	134.6	2.4	26.8	3.1	15.6	182.5	131.6
2	106.5	0.4	31.2	9.7	4.2	152.0	85.8
3	80.5		16.0	30.7	3.7	130.9	114.1
4	94.2	0.3	4.2	5.7	3.7	108.1	181.8
5	118.8	0.6		6.4	0.4	126.2	201.0
6	128.9	0.4	1.5	12.5		143.3	189.6
					Average	140.5	150.7

FORBS-CAREX-EULALIA 13I-12I

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter	
1	34.5	10.9	6.5	3.7	55.6	41.7	
2	24.3	14.8	14.3	19.2	72.6	62.8	
3	23.1	13.4	14.2	14.4	65.1	77.8	
4	41.9	21.3	18.3	3.8	85.3	31.6	
5	54.4	25.1	16.9	1.2	97.6	44.1	
6	63.5	29.5	17.4	0.3	110.7	54.3	
7	43.5	47.3	18.8	1.2	110.8	50.9	
8	34.3	21.4	6.0	8.1	69.8	63.1	
9	40.0	25.3	8.5	9.5	83.3	83.7	
10	61.9	24.2	12.3	5.6	104.0	27.5	
					Average	85.5	53.8

FORBS-CAREX-EULALIA 14F-15F

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter	
1	71.6	7.8	2.8	3.5	85.7	128.3	
2	72.9	13.2	2.1	2.4	90.6	179.1	
3	63.0	1.7	3.2	0.1	68.0	141.5	
4	62.0	0.1	1.0		63.1	179.2	
5	63.5		10.3	1.5	75.2	127.3	
					Average	76.5	151.1

Table 60. Weights of 1600 cm<sup>2</sup> herb and litter samples by important component, October, 1960. Forbs are Eupatorium spp., Aster spp., and Solidago spp.

JUNCUS-FORBS-EULALIA

Sample No.	Forbs	Carex	Eulalia	Juncus	Total	Litter
1	51.7	4.5	16.7	42.2	115.1	166.0
2	25.6	4.4	31.3	62.2	123.5	178.7
3	23.0	24.3	41.5	28.3	117.1	191.3
4	28.8	5.4	14.2	21.5	69.9	156.6
5	12.7	2.2	12.1	36.4	63.4	220.0
				Average	97.8	182.6

Table 61. Weights of 1600 cm<sup>2</sup> herb and litter samples by important component, October 1960. Forbs are Eupatorium spp., Aster spp., and Solidago spp.

Taxon or plant part	1958	Year 1959	1960
<i>Boehmeria cylindrica</i>	3860	4599	
<i>Eupatorium serotinum</i>	4168	4721	
<i>Impatiens capensis</i>	4094	4273	
<i>Eupatorium purpureum</i>	4586	4481	4524
		4487	
		4464	
<i>Polygonum lapathifolium</i>	4166	4271	
<i>Bidens frondosa</i>	4241		
<i>Lespedeza cuneata</i>	4661	4690	4626
	4660	4769	4624
	4553	4603	4743
		5602	
<i>Solidago gigantea</i>		4796	
<i>Eulalia viminea</i>	4330	4273	
		4319	
		4268	
		4256	
<i>Juncus effusus var. solutus</i>		4664	4508
<i>Salix nigra tops</i>	4331	4809	
<i>Salix leaves</i>		4914	4893
			4876
			4973

Table 62. Calories per gram dry weight of selected lake bed plants, 1958, 59, 60. Within taxon and year replication is also within site.

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